

The United States MILLER

Published by
E. HARRISON CRAWKER. { Vol. 16, No. 6. }

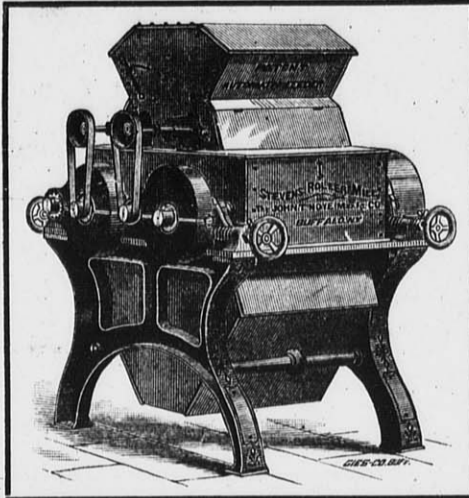
MILWAUKEE, APRIL, 1884.

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OUR SEMI-CENTENNIAL OF FLOUR MILL BUILDING.

Parties contemplating the erection of new Mills, or improving and increasing the capacity of old ones, will serve their best interests by corresponding with and submitting their ideas to us.

Single and Double Roller Mills,
Concentrated Roller Mills,
Round's Sectional Roller Mills,
— ALL WITH THE —
STEVENS CORRUGATION.

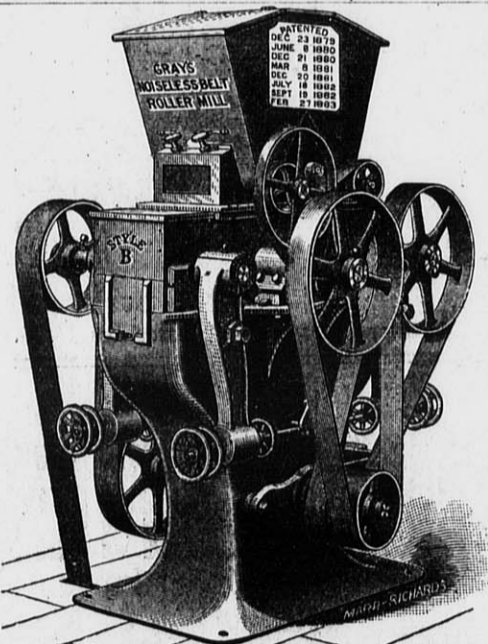


Simplicity of Construction,
Positiveness of Action,
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Less Liability to Get Out of Order,
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Beware of Second-hand Stevens Roller Mills offered by one of our competitors. They were made in 1881 and have since passed through a fire.

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GRAY'S NOISELESS BELT ROLLER MILLS.

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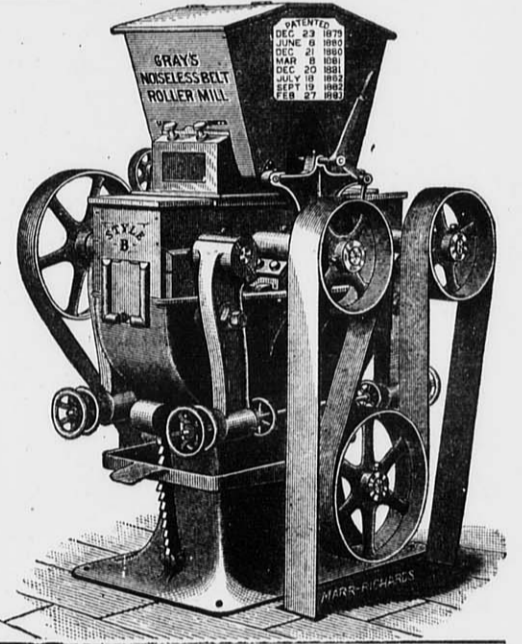
FOR SMALL MILLS.

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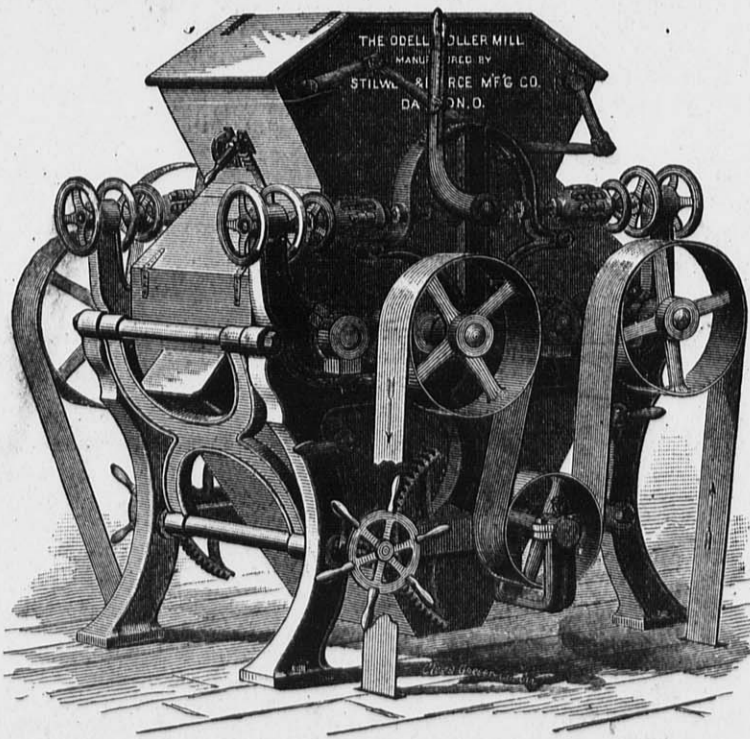
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Reliance Works, Milwaukee, Wis.



ODELL'S ROLLER MILL SYSTEM.

Is now in successful operation in a large number of mills, both large and small, on hard and soft wheat, and is meeting with Unparalleled Success. All the mills now running on this system are doing very fine and close work, and we are in receipt of the most flattering letters from millers. References and letters of introduction to parties using the Odell Rolls and System, will be furnished on application to all who desire to investigate.



ODELL'S ROLLER MILL,

Invented and Patented by **U. H. ODELL**, the builder of several of the largest and best Gradual Reduction Flour Mills in the country,

AN ESTABLISHED SUCCESS

WE INVITE PARTICULAR ATTENTION TO THE FOLLOWING

POINTS OF SUPERIORITY

possessed by the Odell Roller Mill over all competitors, all of which are broadly covered by patents, and cannot be used on any other machine.

1. It is driven entirely with belts, which are so arranged as to be equivalent to giving each of the four rolls a separate driving-belt from the power shaft, thus obtaining a *positive differential motion* which cannot be had with short belts.

2. It is the only Roller Mill in market which *can instantly be stopped without throwing off the driving-belt*, or that has adequate tightener devices for taking up the stretch of the driving-belts.

3. It is the only Roller Mill in which *one movement of a hand-lever spreads the rolls apart and shuts off the feed at the same time*. The reverse movement of this lever brings the rolls back again exactly into working position and *at the same time turns on the feed*.

4. It is the only Roller Mill in which the movable roll-bearings may be adjusted to and from the stationary roll-bearings *without disturbing the tension-spring*.

5. Our Corrugation is a decided advance over all others. It produces a more even granulation, *more middlings of uniform shape and size, and cleans the bran better*.

We use none but the BEST ANSONIA ROLLS.

OUR CORRUGATION DIFFERS FROM ALL OTHERS, AND PRODUCES

LESS BREAK FLOUR and MIDDINGS of BETTER QUALITY.

Mill owners adopting our Roller Mills will have the benefit of Mr. Odell's advice, and long experience in arranging mills. Can furnish machines on Short Notice. For further information, apply in person or by letter to the sole manufacturers,

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Agents for Du Four's Bolting Cloth.

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THE LARGEST MILL FURNISHING ESTABLISHMENT IN THE WORLD.

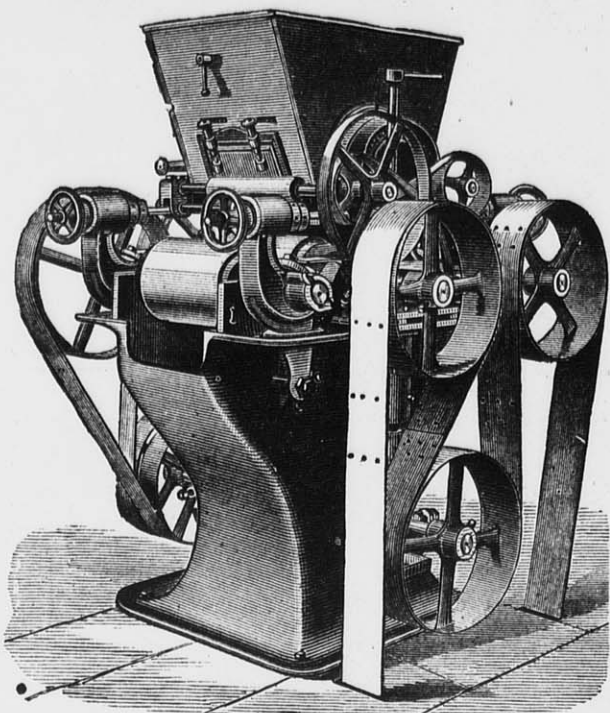
RELIANCE WORKS,

EDW. P. ALLIS & CO., Proprietors.

MILWAUKEE, WIS., U. S. A.

SOLE MANUFACTURERS OF

GRAY'S PATENT



Noiseless Belt Roller Mills

WITH

Wegmann's Patent Porcelain Rolls.

Unexcelled for reducing Middlings to Flour.

Far ahead of Smooth Iron or Scratch Rolls and entirely superseding the use of Mill Stones for this purpose.

Read the Following Letters.

Terre Haute, Ind., Aug. 22nd, 1882.

MESSRS. E. P. ALLIS & Co., Milwaukee, Wis.

Gentlemen:—We are very much pleased with the whole eight set of Porcelain Rolls you put in our Mill. The two double sets sent us soon after starting up our mill last fall, we put in place of two run of stones for grinding our coarse Middlings.

We find the Flour from the Porcelain Rolls much more evenly granulated and much sharper and cleaner than that we got from the stones, besides the second or fine Middlings are much better, being almost entirely free from germs and not as specky.

Yours Truly,

KIDDER BROS.

Kings County Flour Mills, Brooklyn, N. Y., Aug. 15, 1882.

MESSRS. E. P. ALLIS & Co.

Gentlemen:—You ask how I like the Porcelain Rolls as compared with Mill Stones. I have been using the original Porcelain Gear Machines for five years and became convinced a long time ago that Mill Stones could not produce as satisfactory results.

I am now operating your Improved Machine of increased size with nice adjustments, working without noise with Gray's Patent Belt Drive. The Flour it produces is beautifully grainy and strong, and its capacity two or three times more than the old Gear Machine.

It runs splendidly, gives no trouble, consumes less power than Mill Stones, dispenses with costly stone dressing and for reducing middlings and soft branny residuums and tailings is unequalled by any Machine, iron or stone, at least this is my opinion after five years of practical experience.

Yours truly,

JOHN HARVEY,

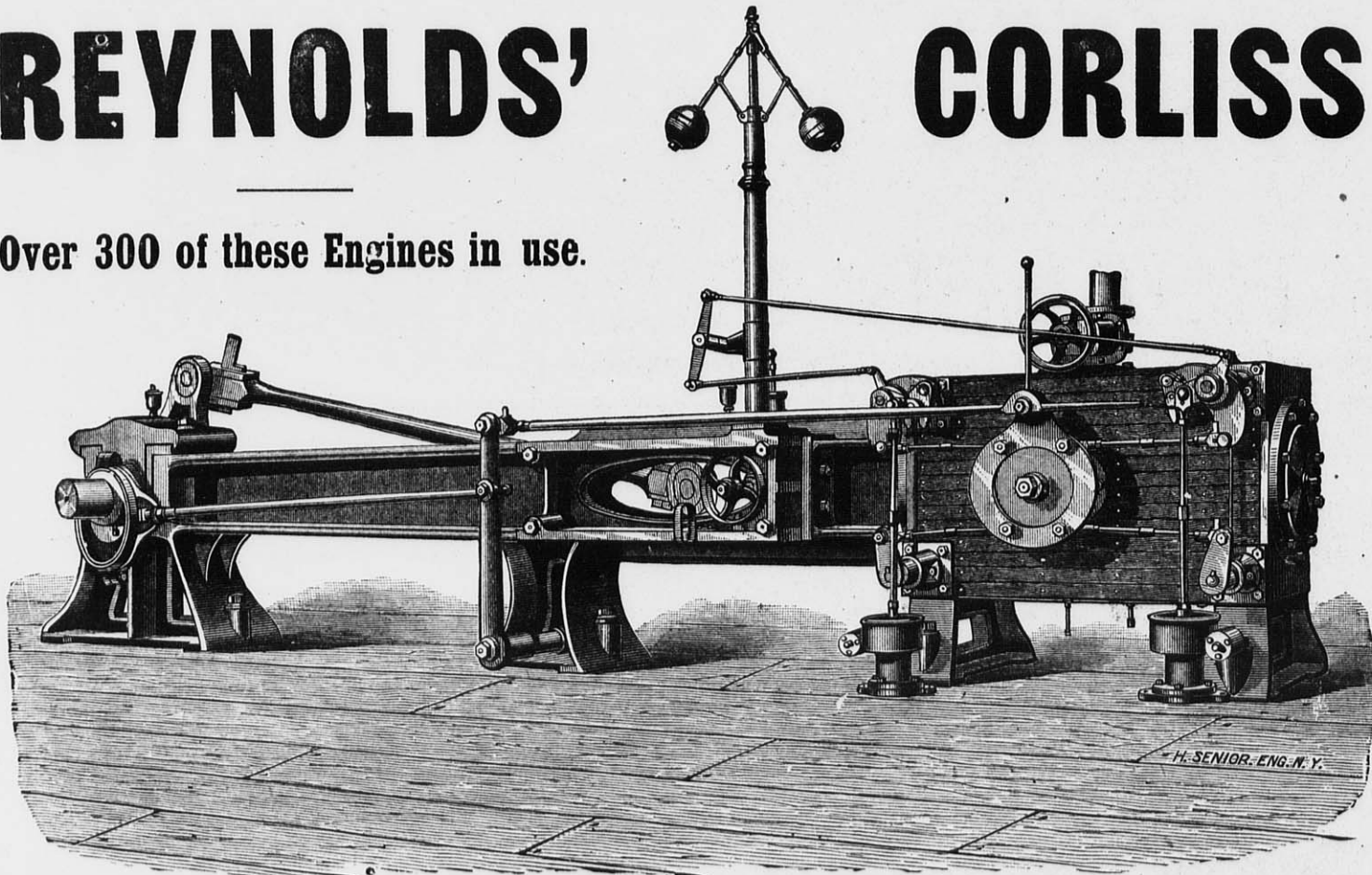
Head Miller Kings Co. Mills, Brooklyn, N. Y.

ALSO SOLE MANUFACTURERS OF THE CELEBRATED

REYNOLDS'

CORLISS ENGINE.

Over 300 of these Engines in use.



These Engines are especially adapted for use in Flouring Mills—being unsurpassed in Simplicity, Durability and ECONOMY OF FUEL, and far ahead of any other

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Send for catalogues of Roller Mills, Flour Mill Machinery, Saw Mill Machinery, Reynolds' Corliss Engines, etc., etc. Address:

Edw. P. Allis & Co.,

MILWAUKEE, WIS.

The following is a partial list of Flouring Mill owners who are using the Reynolds' Corliss Engines.

J. B. A. Kern.....	Milwaukee, Wis.	Albert Wehausen.....	Two Rivers, Wis.	L. H. Lanier & Son.....	Nashville, Tenn.
LaGrange Mill Co.....	Red Wing, Minn.	Green & Gold.....	Faribault, Minn.	Wells & Nieman.....	Schuyler, Neb.
New Era Mills.....	Milwaukee, Wis.	Meriden Mill Co.....	Meriden, Minn.	Grundy Centre Milling Co.....	Grundy Centre, Iowa.
Daisy Flour Mills.....	Milwaukee, Wis.	Townshend & Proctor.....	Stillwater, Minn.	B. D. Sprague.....	Rushford, Minn.
Winona Mill Co.....	Winona, Minn.	Soo & Brinkman.....	Great Bend, Kansas.	The Eisenmeyer Co.....	Little Rock, Ark.
W. D. Washburn & Co.....	Anoka, Minn.	Frank Clark.....	Hamilton, Mo.	A. W. Ogilvie & Co.....	Montreal, Canada.
Archibald, Schurmeier & Smith.....	St. Paul, Minn.	N. J. Sisson.....	Mankato, Minn.	Geo. Urban & Son.....	Buffalo, N. Y.
White, Listman & Co.....	La Crosse, Wis.	Jas. Campbell.....	Mannannah, Minn.	A. A. Taylor.....	Toledo, O.
Milwaukee Milling Co.....	Milwaukee, Wis.	C. J. Coggin.....	Wauconda, Ill.	Pindell Bros. Co.....	Hannibal, Mo.
Stuart & Douglas.....	Chicago, Ill.	J. J. Wilson.....	Algona, Iowa.	Kehler Milling Co.....	East St. Louis, Ill.
Stillwater Milling Co.....	Stillwater, Minn.	Ames & Hurlbut.....	Hutchinson, Minn.	Walsh, DeRoo & Co.....	Holland, Mich.
Otto Troost.....	Winona, Minn.	Lincoln Bros.....	Olivia, Minn.	Goodlander Mill and Elevator Co.....	Fort Scott, Kan.
E. T. Archibald & Co.....	Dundas, Minn.	Northey Bros.....	Columbus Junction, Iowa.	W. Seyk & Co.....	Kewaunee, Wis.
C. McCreary & Co.....	Sacramento, Cal.	Bryant Mill Co.....	Bryant, Iowa.	Topeka Mill and Elevator Co.....	Topeka, Kan.
Gardner & Mairs.....	Hasting, Minn.	David Kepford.....	Grundy Centre, Iowa.	Strong Bros.....	Graceville, Minn.
J. Schuette & Bro.....	Manitowoc, Wis.	Waterbury & Wagner.....	Janesville, Minn.	C. A. Roberts.....	Fargo, D. T.
Minnetonka Mill Co.....	Minnetonka, Minn.	W. A. Weatherhead.....	South Lyons, Mich.	Coman & Morrison.....	Fox Lake, Wis.
J. D. Green & Co.....	Faribault, Minn.	Geo. Bierline.....	Waconia, Minn.	J. G. Schaapp.....	Grand Island, Mich.
F. Goodnow & Co.....	Salina, Kansas.	James McCafferty.....	Burton, Mo.	Fred. Schumacher.....	Akron, Ohio.
A. L. Hill.....	Faribault, Minn.	Geo. P. Kehr.....	Menomonee Falls, Wis.	Warren Mf'g Co.....	Warren, Minn.
Beynon & Maes.....	Owatonna, Minn.	Winona Mill Co. compounding their present 24x60 Winona M.			
Eagle Mill Co.....	New Ulm, Minn.	Forest Mill Co.....	Forest, Minn.		

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Published by
E. HARRISON CAWKER { VOL. 16, NO. 6 }

MILWAUKEE, APRIL, 1884.

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THE OLD MILL.

Brown and broken the old mill stood,
The moss lay black on its shingles gray,
The night-shade crept o'er its sunken sill,
As it silently rotted and moldered away.

The winds moaned in at the crumbling rifts,
And tossed up the dust on the moldy floor;
The sun streamed down through the storm-wrecked roof,
And wove in the gloom its glittering woof,
And the spider ticked in her web of gray,
And the old mill crumbled and crumbled away,
And the long flags waved at the door.

Its broken stone had ceased to swing,
Staring so blankly on the wall;
The red mold sifted it o'er at will,
And the heart's-ease covered it, rank and tall.

The blue fly hummed to the silent gloom,
And the long webs trailed from the crumbling beam;
No footsteps fell, in that voiceless room
Where the spider spun in her silvery loom—
And wounded her prey unseen.

The still wheel lay 'neath the mossy flume,
And the snail crawled over its mossy rim,
The long brakes waved in its gloomy case,
And the glow-worm fell in that rayless place
Where the sun came weak and dim.

The flags grew black on the still, dead tide,
And the lamper-eel drilled at the ancient dam,
The weavers swung 'mong the black'ning ferns,
And the green frog croaked from the slimy sand.
Brooding so silently o'er its decay,
The old mill crumbled and crumbled away.

At night when moon-feet tread its floor,
They say that the bowed old miller comes,
And sits him down in his phantom chair,
And toils away at the sunken stone,
And his spirit lantern breaks the gloom,
And lighted up the webs in the musty room.

But when the day star feeble grows,
And the moon looks down in a dimmer wave,
He fades away in his mystic chair,
And rests again in his sunken grave.

And when the night winds howl and roar,
And the logs burn briskly on the hearth,
The neighboring children cite the lore
Of the phantom miller's nightly birth.

And they shudder and creep unto the hearth,
When the moor-dogs howl to the full white moon,
As they list for the thug of the ruined wheel,
And the roar of the tide in the miller's flume.

THE LOST TEN MILLIONS STERLING.

BY W. A. THOMAS, F. R. M. S.

The Miller market supplement for February states the fact in these words:—"The past four weeks' import of flour, 463,000 English sacks of 280 lbs., infer that 6,000,000 sacks per annum—worth probably ten million pounds sterling—may be confidently expected. Alas! for this ten millions of English money being diverted from English industry." This quotation is very John Bullish. They are English sacks, it is English money, and English industry that is suffering. If the loss is limited to England, and the English branch of milling industry, Sandy and Patrick, John Bull's co-partners, are to be congratulated in missing this "sicht for sare e'en." Ten millions streaming past them, which they long to handle, but cannot! But I fear Sandy and Patrick are suffering quite as severely as John, only, they seem to take it more quietly, while John, hearty, selfish, honest fellow, gives voice to his sorrow. He does not seem to be aware that there are other industries connected with wheat and flour beside milling in England, and that what is loss to one industry may be gain to another. The increasing importation of foreign flour—this source of grief and cause for shame to British and Irish millers—may perhaps be a gain to British and Irish bakers, and the loss bewailed taken as a gauge of the bakers' estimation of home and foreign milled flours. It is a truism that there is no effect without a cause, hence the preference of bakers for foreign flours is doubtless due to their finding its use more profitable. Self interest rules the baker as well as the miller, and the baker would not, could not, continue the use of the foreign article, were there not more money to be made out of it, and yet—here lies the sting for the home miller—foreign flour is dearer than home flour. Many kindly intentioned people—people who do not handle flour practically as the baker does, nor are so well able to value flour for bread-making—look for the milling millenium in these islands, or the retaining of the lost ten millions sterling, in the adop-

tion of new milling mechanism and milling technology.

Beyond doubt these are powerful aids, but, as this writer sees it, they are only one-third of the factor if it is to succeed. To-day it is doubtful if American millers, who pocket three-fourths of the ten millions, operate more or better milling mechanism for the gradual reduction and purification of wheat to flour than British and Irish millers. Yet the American flour flood is still rising; bakers still prefer it and pay more for it. Nor can

practical experience and common sense for guides, they heat the wheat before milling and find the bran quite as tough as if they had soaked in 8 lbs. water to every 100 lbs. of the grain. Science explains it thus: All grains in a natural state contain certain percentages of moisture—water of hydration—and these quantities may range from 6 to 16 per cent. When the grains are submitted to the dry heat of steam wheat heaters—should never be over 120° Fahr.—this latent water expands, is converted into vapor, and forces



THE OLD MILL.

it be said that the scientific technology of the home miller has helped him to arrest one farthing of the money flowing away, nor the want of this new knowledge by American rivals kept back one penny from them. Why? Well, it seems to me that milling science and technology have not reached the height of enabling the baker to produce high-class bread out of the flour of inferior wheat. The success of American milling is mostly due now to the selection of finer wheat and more honest milling. If you will allow I will try to explain. The Miller for February wants "Red Fyfe wheat for English millers." (John is satisfied, I suppose, with the quality of this Manitobian cereal held and used by Scotch and Irish millers.) Very good. But if English millers when they get this grand hard wheat, were to dampen—"mellow," the crafty call it—as they were advised and do dampen Indian and Russian wheats, then I for one would regret that one grain of Red Fyfe, or other hard spring, should be milled outside of America, or the Province of Manitoba. The damping of any wheat by the miller is injurious to it; and, where an equivalent is not allowed on the resulting flour, it is a fraud on the purchaser—the baker. The millers of America, Hungary, and Russia, who supply our demand for high-class flours from hard wheat, add no fraudulent addition of water for "mellowing" before reducing the wheat to flour. Taking

its way from within outward, and, passing through the skin or bran of the grains, softens or toughens them. At least, this treatment softens the bran enough to enable these foreign millers, with the aid of rolls, tender reductions and purifying machinery, to produce flours that bakers prefer. I may err, but I believe that is or should be the aim of scientific and profitable milling. This foreign system is known as *dry* and honest milling,—the home system is known as *wet*, dishonest and fraudulent milling, because wetting wheat is unnecessary, and the miller sells to the baker water at the price of flour. How knowing, crafty, unskilled millers overreach themselves is nowhere better illustrated than in the case of milling in Australia. The highest priced and finest wheat in the world is grown in South Australia, and yet the flour from Australian mills sells here only a little over the lowest, and most worthless flours in our markets. Why this is so will be seen in part, but in part only, in *The Miller* for February, where "Our Special Correspondent" describes a visit to one of the flour mills of South Australia. The whole article is worth reading, but the part to which I would beg the attention of bakers is the following:—

"The wonderful dryness of the wheat of South Australia enables it to absorb a great deal of moisture. 'But what is the reason of this damping?' I fancy I hear you ask your

guide—'Our Special.' 'Oh! that is to help the color of the flour; it will make the flour very much whiter than if it was ground dry.' (Credit Judas.) Then again you ask, 'Does it give any larger return of flour?' 'Well,' says your guide, 'that is not thought of at all, but he fancies it will give a larger return.' To which *The Miller* appends the remark, "So do we." And this is all the editorial "we" says about it in this case, or in the almost regular practice at home. The motto of Australia is "Advance, Australia," but the milling advance there is retrograde, and it may safely be predicted that it will remain so, while they damp their wheat, grind it on stones, and sell the exported flours in these markets at a shade over the price of American "Red Dog."

But, happily, the milling revolution—the dawn of common sense in the production of flour—has extended to Australia, and we shall soon find her millers dry milling her grand wheat by systems of gradual reduction on rolls, instead of stones, and exporting faultless flour instead of wheat—a flour for bread-making not surpassed by the best from Hungary or Minneapolis. And this dawn will not, I venture to think, be arrested at Australia. When it becomes clear that India can be relied on for wheat improved by culture and cleaning, and the transit charges lowered, then it will be found there, as elsewhere, more profitable to export flour than wheat. These desiderata of the baker—dry-milled flour from Australia and India—will be hastened by home millers continuing to wet-mill dry wheats. Were this the only pernicious practice of our millers the lost ten millions would not have been so many. But it is a matter of notoriety, and I can supply proof that they largely adulterate wheat flour with rice flour. There is an idea amongst them that, if rice is ground and dressed sufficiently fine, it cannot be detected—that detection is only possible by comparing the size and shape of the starch granules. This idea is a delusion. Unless it is prepared as fine as found in Coleman's corn flour—and even then by shape—this writer can isolate and point it out. This is not an idle boast—simply a note of warning.—*From the British and Foreign Confectioner for March.*

THE COMING HOTEL.

The *American Architect* says: The following is the translation of an article in a Berlin paper which will convey an idea of the German estimates of the coming American hotel:—"The latest American progress in building will be the 'mammoth hotel' soon to be erected on the Shell road, St. Augustine, Fla. This enormous hotel is to have a frontage of three English miles long and a depth of six miles; the height of seventy-seven stories, will measure 3,840 feet from the ground-floor to the roof. This hotel will have no stairs, but five hundred balloons will always be ready to take guests up to their rooms. No room-waiters are to be employed, but visitors will be served by a newly-patented automaton, put up in every bed-room, which will do all shaving, shampooing, etc., for the guests by a very simple and ingenious mechanism. Supposing the guest requires hot water, the automaton will be able to call down-stairs: 'A bucket of water for room No. 13,107,' and the water will be up in seven seconds by a patented elevator. Half an hour before *table d'hôte*, instead of ringing bells, a gun (twenty-four pounder) will be fired on each floor to call the guests to get ready for the meals. The tables in the dining-rooms will measure four miles each, attendance being performed by waiters on horseback on either side of the table. Music during *table d'hôte*, will be played, *gratis*, by eight bands of seventy-seven men each. For the convenience of visitors a railway will be built on each floor, as well as telegraph-offices. The price of one bed-room will be from \$1 to \$10. The cost of this building is estimated to be \$680,000,000. The billiard-room will contain nine hundred American, ninety-nine French, and one English table, and most of the visitors are expected to be Americans. The billiard-room will be fitted out with a spittoon of 100 feet in circumference."

UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

PUBLISHED MONTHLY.

OFFICE, NOS. 116 & 118 GRAND AVENUE, MILWAUKEE.

SUBSCRIPTION PRICE—PER YEAR, IN ADVANCE.

To American subscribers, postage prepaid.....\$1.00
To Canadian subscribers, postage prepaid..... 1.00
Foreign subscriptions..... 1.50All Drafts and Post-Office Money Orders must be made payable to E. Harrison Cawker.
Bills for advertising will be sent monthly, unless otherwise agreed upon.
For estimates for advertising, address the UNITED STATES MILLER.

[Entered at the Post Office at Milwaukee, Wis., as second-class matter.]

MILWAUKEE, APRIL, 1884.

We respectfully request our readers when they write to persons or firms advertising in this paper, to mention that their advertisement was seen in the UNITED STATES MILLER. You will thereby oblige not only this paper, but the advertisers.

WISCONSIN STATE MILLERS' ASSOCIATION.

SECRETARY'S OFFICE.

MILWAUKEE, March 29, 1884.

The annual meeting of the Wisconsin State Millers' Association will be held in the parlors of the Plankinton House, this city, Tuesday, April 8th, at 2 o'clock P. M., for the purpose of electing officers for the ensuing year, and transacting such other business as may be brought before the meeting. A full attendance is desired.

S. H. SEAMANS, Sec'y.

We will furnish one copy of ROPP'S CALCULATOR in plain binding and the UNITED STATES MILLER for one year for \$1.00. See large advertisement in this paper. Subscribe now.

THE Garden City Mill Furnishing Co. of Chicago, reports an excellent trade.

BUCKWHEAT flour and corn meal are the principal bread stuffs used by the peasant classes in Southern Austria, Italy and Roumania.

S. T. CUMMINGS, proprietor of the Pine Grove Mills, at Oxford, Mich., has got a "new process" cow. She is now nursing three healthy calves.

We are indebted to the UNIVERSE PUBLISHING Co. of St. Louis, Mo., for the use of the handsome illustration of "The Old Mill" on our first page.

THE *Millers' Journal* of New York comes out in a new cover "as handsome as a daisy." Bro. Tepper is undoubtedly getting up steam in his milling literary department.

We will furnish one copy of ROPP'S CALCULATOR in plain binding and the UNITED STATES MILLER for one year for \$1.00. See large advertisement in this paper. Subscribe now.

DURING the month of March many portions of the United States have been visited by floods and violent storms. It is said that the Mississippi River has been ninety miles wide at some points during March.

THERE are thirty-two customs districts in the United States, which do not collect duties to the amount of the expense of maintaining the offices. The State of Maine has one-fourth of these unprofitable customs offices.

THERE have been shipped from Newport News to South America, since the 1st September last, 52,500 bbls. flour. The shipments from Baltimore to Brazil and the West Indies for the same period have been 135,728 barrels.

THE Commission appointed to examine the various systems of milling used in France have completed their examination which included nine different systems, but their conclusions are very indefinite and French millers will have to use their own judgment as heretofore in determining which system they will adopt. The tests included low and high milling with stones, stones and rollers combined, rollers of different styles alone and disk mills.

We take pleasure in acknowledging the receipt of copies of a very handsome and entertaining magazine published by the Universe Publishing Co. of St. Louis, Mo., and entitled "The Universe." It embraces, within the scope of its original and selected articles, essays on topics of general interest, sketches of travel and adventure, descriptions of scenes and places, religious, historical and biographical sketches, art studies, notes on education, science and material progress, stories, poems, etc., etc. In short, it is a portfolio of refined and valuable literature. The subscription price is \$1.50 per year.

WE will furnish one copy of ROPP'S CALCULATOR in plain binding and the UNITED STATES MILLER for one year for \$1.00. See large advertisement in this paper. Subscribe now.

A. B. STOCKWELL, a well-known speculator, who failed in business some time since, in speaking of his ups and downs in business, said to a friend: "When I came from Cleveland I was called Mr. Stockwell; when I began to operate largely I was called Captain; when I became a big man in the market the operators called me Commodore; and after I lost my fortune they spoke of me as 'that red-headed dog from Cleveland.'"

THE decision of the suit of Smith vs. Goldie et al., for infringement of middlings purifier patents in the Dominion of Canada, may now be considered final, as the Privy Council in London has refused with costs, the application of the defendants for leave to appeal from the Supreme Court of Canada. The Geo. T. Smith Co. have established a manufactory in Canada, and Canadian millers can now obtain Smith purifiers as cheaply as millers on this side of the line.

A bill has passed the United States Senate providing for the construction of seven steel cruisers—one of 4,500 tons; one of 3,000 tons; a dispatch vessel of 1,500 tons; one heavily armed gun-boat of 1,500 tons; one gun-boat of 750 tons; and one of 900 tons; a steel ram; a cruising torpedo boat, and two harbor torpedo boats. This is well, and we hope Congress will go on building a reasonable number of ships, until we own something that it will not be farcical to call "Our Navy."

AT Minneapolis a pair of violet stock buhrs were recently sold for \$17.50, which cost \$215 six years ago. During the same week the North Star Iron Works of Minneapolis sold four runs of stones to go into a Minneapolis mill; and further, Henry Crossen, one of the leading millwrights of Minneapolis, in drawing up plans for a 600-barrels new roller mill, provides for seven runs of stones. Other instances where millstones are in favor, for at least a portion of the reduction process, might be mentioned.

DURING the past month we have been favored with calls from the following gentlemen connected with the trade:

Geo. T. Smith, Jackson, Mich.; Geo. S. Bennett, Jackson, Mich.; Alex. Smith, St. Louis, Mo.; C. H. Seybt, Highland, Ill.; L. B. Kohnle, superintendent of the Lima Millfurnishing Works, Lima, O.; M. H. Buck, Delafield, Wis.; W. C. Edgar, business manager of the *Northwestern Miller*, Minneapolis, Minn.; L. V. Rathbun, Rochester, N. Y.; S. H. Seamans, Milwaukee, Wis.; Mr. Craig, of the Craig Wheat Cleaner Co, Detroit, Mich.

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BE CAREFUL TO WHOM YOU CONSIGN FLOUR.

Millers should be well satisfied of the responsibility of city flour firms before consigning flour to them. It is not difficult to obtain information on the subject. An incident recently happened which carries its lesson with it. March 12, F. W. Pullen & Co., flour dealers at 132 Kinzie st., Chicago, were made defendants to a suit for a capias by the L. C. Porter Milling Company, of Winona, Minn. The plaintiff's attorney says that Pullen's method of doing business was to send out circulars to the various millers of the North-west asking for samples of flour and upon receipt of a sample to order a car-load "just like it." When asked for references he gave the name A. Goodrich, "his banker," giving the address of the lawyer by that name. The "banker" answered all inquiries as to the standing of the flour-firm by would-be consignors, by assuring them that the firm were worth \$20,000, and that he had perfect confidence in them. The Porter Company, on receiving an order for 125 barrels of flour, instructed their agent there, Leyden Porter, to look up the firm. Relying upon Pullen's assurance that he was worth \$15,000 Porter marked his application for flour at thirty days "O. K." and the credit was given. When the note fell due another order for 125 barrels was received and honored, but the note returned with a request for further time. A week ago Pullen confessed judgment to A. Goodrich for \$1,500, and when the sheriff called to collect the judgment, the door was closed and the bird flown. Now the Porter Company wants Pullen arrested for obtaining goods under false pretenses. Mrs. Selmar A. Hillier began an attachment against Pullen on a draft for \$725 which he accepted but never paid. A number of country millers have been victimized by Pullen, and some of them will probably be heard from soon through the courts.

ANOTHER PROBABLE COMPROMISE OF PATENT CASES.

We have learned that a matter of great importance to all millers in the United States using roller-mills is now being considered by the executive committee of the Millers' National Association with a view to effecting a compromise extremely favorable to all members of the association. From information on the subject, which we are confident is perfectly reliable, we believe that the protection to members gained by this compromise will be of great pecuniary advantage and we would suggest to members whose dues are not paid up to put themselves in good standing on the treasurer's books at the earliest possible moment. To those millers who are not members of the Association we would suggest that it would be a good thing for them to take steps at once to become members—in short—"to get under cover before the rain begins to fall." The members of the committee are very reticent about giving information.

THE enormous proportions attained by the glucose industry in the United States, and probably some disquieting rumors that have found currency concerning the wholesomeness of the product, appear to have induced the American Commissioner of Internal Revenue to ask the aid of the National Academy of Sciences in investigating the subject. The Academy entrusted the inquiry to a committee, which has recently reported its opinion. That the processes at present employed in the manufacture of sugar from starch are unobjectionable, and leave the product uncontaminated; that the starch sugar thus made and sent into commerce is pure and uniform in composition, and contains no injurious substances; and that although possessing, at most, only two-thirds of the sweetening power of cane sugar, nevertheless, starch sugar is not inferior to it in healthfulness, no evidence having been met with that maize starch sugar, either in its normal condition or when fermented, has any deleterious effect upon the constitution, even when taken in large quantities. It is estimated by the committee that the industry in the United States gives employment to twenty-nine factories, which together represent a capital of \$5,000,000, consume about forty thousand bushels of maize daily, and produce "glucose" and "grape sugar" to the value annually of \$10,000,000.

FRENCH MILLING INDUSTRY AND THE NEW PROCESSES.

BY PAUL SEE.

The fifteen million hectares of land in France, on which cereals are raised, produce 42 per cent. wheat, 27 per cent. oats and the remainder divided between buckwheat, barley, millet and meslin.

There are, consequently, about seven millions hectares used for the cultivation of cereals intended for food. The average yield per hectare being 15½ hectolitres, the total produce is approximately figured at one hundred million hectolitres, an annual yield second only to that of the United States.

As to yield per hectare, however, France is very far from occupying the front rank, as the following comparison with other European countries will show:

England produces.....	26 hectolitres.
Belgium and Saxony.....	23 "
Holland.....	21 "
Norway.....	20 "
Germany.....	19 "

We have thus a long road to travel before catching up with the rest of the world and by improving our methods of husbandry, we should be able not only to produce sufficient for our own needs, but also for a considerable export.

In reality our average yearly deficit is only four million hectolitres, that is to say four per cent. of the total yield, and in order to make up this and have enough for home use, we need only bring up the production to 16 hectolitres instead of 15½. If we produced the same average as England, we could export the enormous amount of sixty-six millions hectolitres, worth at the present price 1,260,000,000 francs. There is no use counting on such a result at once, but there is a well founded hope of an improvement, since the northern part of the country already produces 20 hectolitres* per hectare† and improved methods of agriculture are constantly being introduced.

It must not be forgotten, however, that the average consumption per inhabitant seems to increase at a more rapid ratio than the production of the cultivated soil. Thus in 1821, this consumption was 1½ hectolitres, while in 1882 it had reached 2 1-10 hectolitres. On the other hand, the population increases; not much, to be sure, since in this respect we are marching almost in the last line among the nations of the globe, but still somewhat every year.

Coming now to the milling industry, we find that, up to a very recent time, our exportation of flour more than compensated for the deficit in the crop.

French milling was justly celebrated throughout the world. The more refined taste of our city population, the skill of our millers, and particularly of our stone-dressers, the exceptional excellence of the mills of Ferte-sous-Jouarre, assured us an undoubted supremacy in the whole world for fine flour. But these things have changed entirely and a schedule of the importation and exportation of flour since 1872, shows the extent of our losses.

Thus in 1875, France imported 31,537 quintals of flour and exported 2,576,522 while in 1882, the import reaches 380,000 as against an export of 96,000 quintals.

And what is the cause of this? Should the new milling processes so extensively introduced in foreign countries, and which French millers have rather rashly despised, really be superior to our fine stone mills? And are really the Hungarian, and German inventors, who so long have in vain tried to gain the attention of our millers, on the point of conquering our prejudices by the most irresistible argument, ruin? One might think so from the excitement which now, a little late, agitates the milling world.

The association of dealers in grain and flour in Paris has opened a subscription for proceeding with a comparative examination of the old and new methods, and its appeal has been heeded. The government has aided and encouraged these experimental researches. Although it seems somewhat late to commence studying a question settled ten years ago at least, the result can be but beneficial.

It is only to be regretted that the resources are limited, and that the number of competitors is restricted and not at all commensurate with the real numbers of French and foreign mill builders, who are contending for the supremacy.

We must furthermore not lose sight of the fact, that this proceeding, however well carried out is not of a character to solve the question as effectively as individual effort and enterprise. It is necessary to break with old habits, and, if found desirable, to visit modern mills, and study, impartially and without prejudice, new appliances.

Certainly the necessity of changing the apparatus is no small matter and a large number of millers lack capital, unfortunately. But general prosperity is the only thing to take into consideration, and if we wish to avoid seeing this ancient glory of France go the same way as certain other glories, it must be done by a combination of capital.

We shall have to spend, it is said, one hundred million francs for putting the apparatus of our milling industry on a par with modern progress. What are one hundred millions for a country, that annually spends four or five times as much on its public works? It is not money that is lacking, nor intelligence, nor skill, but curiosity and modesty, taste for traveling and enterprise.

It is a pity that it was necessary to hear the alarm of the export trade, before moving in the matter. Is it not now too late, and will not the foreign markets, now monopolized by America and Germany, remain closed against us forever? Time alone can tell, and, at present, the question is how to save for us our own market which is now equally threatened.

Hungarian flours are brought to Paris notwithstanding an import duty of 1.20 francs per quintal (100 pounds) and considerable expense for transportation, and are sold, thanks to their beauty, at an advance of 50 per cent. over our home manufacture. This is proof enough that we are unable to make as good a product, for no sort of reasoning can stand in opposition to an economic fact, and even time-honored routine will have to give in.—Translated from the *Journal de la Meunerie (Paris)* for the *United States Miller*.

*An hectolitre is equivalent to about 2 5-6 Winchester bushels.
†An hectare is equivalent to 2.4711 English acres.

FIRE PROOF MILLS.—A flouring mill absolutely fire proof has recently been finished near Gotha, in Germany, and its construction is noteworthy, as not a single piece of iron was used in the ceiling and floors. Time and again the dangers in the use of iron for these purposes have been discussed, as the heat of the fire expanding a beam exerts an outward pressure on the walls and has often caused the entire destruction of the building. In this mill in question brick arches were used throughout, and they proved to be cheaper than the iron, a matter of no small surprise to those specially interested in this building.

THE smallest invention sometimes proves the most lucrative. A San Francisco lady, inventor of a baby carriage, received \$14,000 for her patent. The paper nail, the invention of a Chicago lady, yields a large income. The gimlet-pointed screw, the idea of a little girl, has realized millions of dollars to its patentee.

[Written for the UNITED STATES MILLER].

RYE MILLING.

(Continued from March Number).

In order to give the readers of the UNITED STATES MILLER an idea of an under-runner-mill, with 3½ foot stones, which I think is the most suitable for the manufacture of rye flour, herewith are presented drawings illustrating it.

The stones are surrounded by a square cast-iron frame. Fig. 1, represents a side view of the frame, showing the manner in which it is fastened to the husk floor; and how the upper stone frame rests on the four corners and how it is adjusted, and also the bridge-tree for the upper end of the spindle; Fig. 2, is a view from the same side with the square frame removed. It shows the curb which surrounds the stone; the spindle *a*; the driver *b* and the fastening to the spindle on the face side of the runner; *d* is the stone in which the three-winged support is fastened; *e*, is a flat stone which forms the filling of the runner and in which the driver is secured; *f*, in Fig. 2, and Fig. 3 is the cover of the upper stone cast in one piece, with four apertures to receive the bolts which hold the top stone in position and set-screws to secure the bolts firmly in place; two projections *g*, opposite one another, which fit tightly between the outside cast frame and are connected to it by two bolts so as to form a solid and substantial connection of the whole; *h h*, in Fig. 2, are two wrought-iron pieces about two inches square, on which the top stone rests with the projecting ends turned off round to about 1½ inches in diameter, and the length of shoulder closely fits the inside width of the cast-iron frame, these shafts being fastened with bolts to the top, so that the top stone can be turned over on the round ends of the shaft for dressing, the boxes in which said shaft rests being regulated by set-screws as shown in Fig. 1.

Fig. 4, shows the front and rear sides, which are bolted to the corners, as shown in Fig. 3. Fig. 5, shows a bearing on the spindle just above the pulley, or gear-pinion, which drives it. Fig. 6, shows the same from the top side where the belt pulls to, or opposite the gear-wheel, and, if properly regulated, it will prevent the springing and trembling of the spindle.

HOW TO TRAM THE RUNNER.

If the face of the runner is level the spindle is perpendicular. Loosen the four bolts on the bearing above the pulley (Fig. 6) sufficiently to allow the box to move freely with the spindle; get the face of the runner level by moving the point of the spindle and then fasten the box as the spindle stands; now take the bridge-tree, above the stone, off, and lay the top stone on and replace the bridge-tree again; then loosen the flour bolts again on said box below; lower the top stone or raise the runner until both stones come in contact. The upper end of the spindle is four-cornered; put a wrench on this and turn the spindle around by hand, and you will hear exactly where the stones touch each other. Regulate the top stone by the set-screws on the corners, until the sound is even all around; then fasten screws 1 and 2, on the box above the pulley, but so as not to alter the tramping of the stone; also fasten the two screws on each end of the box. In this manner, after a little practice, the miller will be able to tram the stones as good as possible. If there are any high spots on the stones they will soon work smooth if the miller knows how to dress them. Such stones will straighten themselves if a careful miller handles them.

Where the spindle passes through the floor below the runner, there is an open space of about two inches around it. (Fig. 2.) There is also an open space between the under side of the runner and the floor. The motion of the runner produces an air draught upwards through the meal as it leaves the stone; if the miller desires more draught he may cut three furrows in the lower side of the runner, with a good opening at the eye, and give the furrows a discharging direction, as on the grinding face, but put the backside of the furrow on the opposite side, so that the back of the furrow is on the working side and not in the feather edge as on the grinding face.

If there is too much draught, have two slides of sheet-iron put under the floor against the spindle with a half circle cut out of each the size of the spindle and then the draught can be regulated at will.

Under the plate above the upper stone (Fig. 2), there is a circular wooden strip screwed on (marked X); to this strip a cloth is tacked, which drops down over the upper rim of the curb, and is held there by an India-rubber band which is pulled over the curb. This cloth allows the warm air to pass out and keeps the dust inside of the curb, thus cooling off the meal as it leaves the stone, which will make the bolting easier. On the bottom edge of the cloth above mentioned, a thick cord (about ½ inch in diameter) should be sewed, and the rubber band should be placed just above it. This will hold it firmly

in position. When the cloth becomes filled with hardened dust from the warm air passing through it, put on a clean one; but in milling with this kind of a mill but little heat will be produced. K.

[TO BE CONTINUED.]

WHEAT AND CORN.

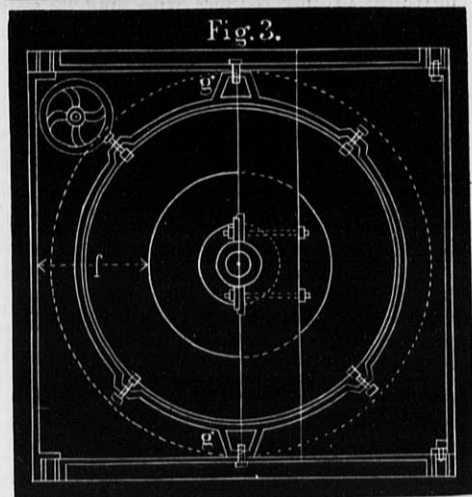
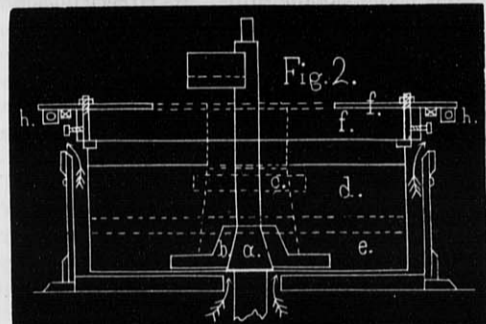
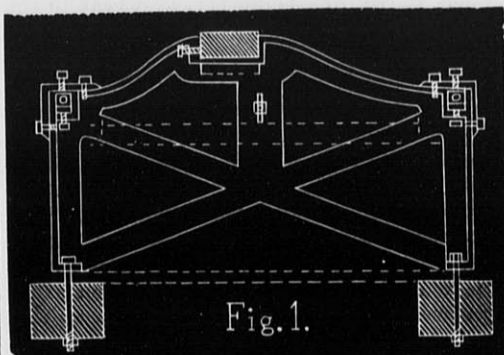
The report of the Department of Agriculture just issued says:

The returns of stock of wheat on hand on the 1st of March (in farmers' hands, and not in grain elevators), indicate a remainder of 28.4 per cent. of the crop, very nearly the same proportion of the crop as in the investigation of last year, but representing about 119,000,000 bushels instead of 143,000,000, or a reduction of 24,000,000 bushels as compared with the stock of March, 1883. In comparison with previous years, the stock on hand is nearer that of March, 1882, when the crop was only 383,000,000 bushels. The crop of last year, as estimated, exceeded that worst of recorded crops by 37,000,000 bushels, and the present stock is larger than that of two years ago by 21,000,000 bushels. The following statement makes comparison for four years:

	Bushels.
Wheat on hand March 1, 1881.....	119,000,000
Wheat on hand March 1, 1883.....	143,000,000
Wheat on hand March 1, 1882.....	98,000,000
Wheat on hand March 1, 1881.....	145,000,000

PROPORTION OF GRADES.

An examination of the inspection records of wheat in the principal cities shows that



very little grades as No. 1, so that practically No. 2 is the highest grade. As is well-known, No. 2 is the standard grade for quotations of prices of wheat.

A compilation of the statistics of the Chicago inspection, shows that in five years but 3.9 per cent. of the winter and 3.1 of spring was classed as No. 1, while 64 per cent. of winter and 52.6 of spring was graded No. 2. There was 8.4 per cent. of winter below No. 3 and 12.6 per cent. of spring.

The record shows also that three-fourths of the receipts at Chicago are of spring wheat. The proportion of all the lower grades is much greater in spring than in winter wheat, a result of the primitive and negligent style of cultivation in vogue in the districts where all-wheat farming is practiced.

Only 55.7 per cent. of the spring wheat of Chicago, between 1878 and 1882, passed as No. 1 and No. 2, while 67.9 per cent. of the winter wheat was classed in those grades, a difference of more than one-fifth in favor of winter wheat.

CORN.

The report of consumption and distribution of corn and wheat of the United States, from returns of the Department of Agriculture on the 1st of March, shows 67 per cent. of the corn crop has gone into consumption, leaving 33 per cent. still remaining on hand, against 36 per cent. of the crop of 1882, on the 1st of March, 1883. This shows a reduction of 75,000,000 bushels.

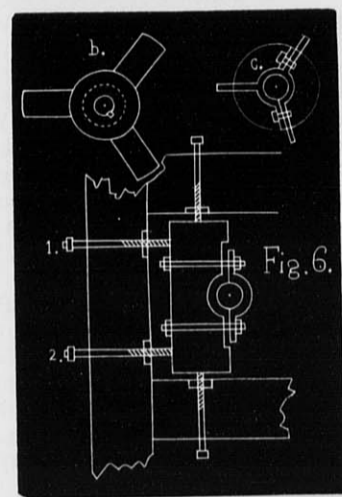
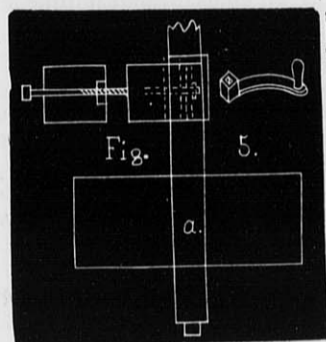
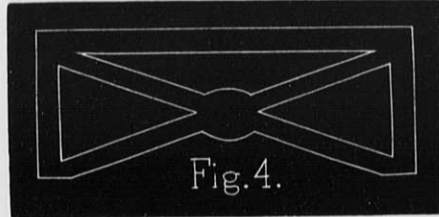
In Michigan, Wisconsin, and Minnesota the stock is but 10,000,000 bushels, against 24,000,000 last March.

In the belt including Ohio, Indiana, Illinois, and Iowa, producing 543,000,000 bushels, the stock is only 146,000,000, which is less by 40,000,000 than the stock on the 1st of March, 1883.

The entire Ohio Valley and Northwestern States, which produced 74 per cent. of the crop, has only three-tenths of the crop on hand. Michigan reports but 16 per cent. of the State crop as remaining, Wisconsin only 15, and Minnesota 18—an unprecedented reduction in quantity, with very inferior quality.

In the South, where corn is mostly used for working animals of the farmer, and for subsistence of the human workers, there is 41 per cent. on hand, which is less than usual, as nearly half the annual requirement for man and beast is needed after March 1. The mules, horses, and oxen which are used for hauling cotton to market, returning with plantation supplies, have a far severer task with the plow for four months of spring and summer, in which corn is almost the exclusive feed.

In the Eastern and Middle States nearly one-third of the home production of corn remains. The little grown in a large part of this belt is held for home use, and distributed through the year. The city and village consumption for feeding of domestic animals, for dairies, and fattening of cattle and swine, to a limited extent, is derived mostly from the Western surplus.



MECHANICAL KNEADING OF DOUGH.

BY CHARLES TOUAILLON.

It has been claimed that the mechanical kneading of bread makes it rough and hard to the taste, and imparts to it a predisposition to dry and harden more rapidly than bread worked by hand in the old-fashioned manner. An investigation of this charge, as to a serious defect in the machine-worked bread, consisting of a lack of mellowness and too rapid drying, leads to the following result:

There is no difference between dough worked by hand and dough prepared by mechanical kneading, provided a good system is used, and the laborer employed for the work knows his business. The kneading trough, not supplied with human intelligence, is only an instrument capable of producing satisfactory results, in so far as it is governed by a good kneader. A poor quality of bread obtained by such a process must, therefore, be attributed to some other cause than the trough.

Harshness and too rapid drying of bread may be the result of one or more of the following causes:

1. A too far advanced state of fermentation, which has diminished the extensibility of the gluten.
2. Using too cold or too warm water.
3. Using a baking room in which the temperature is so low as to interfere with the preparation of the dough, and a bread-room in which the bread is cooled immediately after leaving the oven.
4. Using uneven flour, which always produces a firm dough that becomes disintegrated

when the bread is stale, and the crumbs in the mouth form themselves into a kind of sand, which only with difficulty is swallowed.

This is the trouble with English bread. In order to swallow it comfortably, it is necessary to cut it in thin slices and cover them on both sides with butter. In this condition it gets into the stomach without having been subjected to the first stage of digestion that imparts to well-made bread, at the moment when it is mixed with the saliva, that slightly sweet taste which makes one eat it with pleasure, and without getting tired of it.

Bread is a nutriment which seems designed by nature exclusively for man, the only animal whose saliva possesses the faculty of converting starch into sugar. This transformation takes place spontaneously in the mouth, but only when the bread is made from even flour. Granular flours, which are now used so extensively in England, can only produce aqueous and insipid bread, to which the French people would never become accustomed.—Translated for the United States Miller from the *Journal de la Meunerie* (Paris).

HARVEST TIME.

The grain harvest, by reason of the climatic differences between the several zones and the varying seasons resulting therefrom, must be done in very different times in different parts of the earth. This fact is well-known, but nevertheless, there are very few who are aware that the harvest season comprises no less than three-fourths of the whole solar year and that there are really only two months in the year, during which no grain is harvested in any part of the globe. Beginning with January we find that the crops are gathered in, during this month, in Australia, New Zealand, the greater part of Chili and in some belts of the Argentine Republic. In February the harvest begins in the East Indies, continuing throughout the month and ending in March. Mexico, Egypt, Persia and Syria harvest in April, and in May the northern part of Asia Minor, China, Tunis, Japan, Algiers, Morocco, and Texas. In California, Spain, Portugal, Greece, Sicily and some of the southernmost departments of France, harvesting takes place in June. In the month of July the crops are harvested in France, Austria-Hungary, South Russia and the greater part of the United States, after which Germany, Belgium, the Netherlands and finally Denmark fall into line during August. At last during September, it is harvested in Scotland, Sweden and Norway, in the principal part of Canada and in Russia. Even in October harvesting frequently takes place in the northern part of Finland. Consequently it is only the months of November and December that are entirely free from harvest work.—Translated for the United States Miller from "Der Walzen Mueller."

POISONING FROM MILL-STONES FILLED WITH LEAD.

The Bakers' and Confectioners' Journal, published in Berlin, Germany, has the following: "A peculiar case of lead poisoning occurred in the village of Gœdnitz near Zerbst. A man named Rauchfuss of that place took some grain to a neighboring mill and had it ground into flour, out of which bread was made. Very soon after eating of this bread, both he and his wife were taken ill with violent symptoms of lead poisoning, particularly severe in the case of the wife. The baby, which she nursed herself, died, but the parents have a fair chance of recovery. Investigations were made at once, which led to an examination of the bread and the mill. It appeared that the stones of the mill in question had just been newly filled with lead and that the corn belonging to Rauchfuss was the first ground after the filling. A piece of the bread given to fowls resulted in their death, but it had no appreciable effect on hogs. Filling the holes in mill stones with lead has been the cause of so many accidents, that it should be prohibited by law, as has already been done in Loraine by a proclamation of the governor of the province, dated Feb. 22d, 1882; a prohibition that would work no hardships, since there are harmless substances sold for this purpose by means of which the same object can be attained much more satisfactorily and without any danger to health whatever.—Translated from the German for the United States Miller.

An advocate of cotton belts says: "Woven belts give and take. This is in the nature of a woven material. When first put on, they require 'taking up' once or twice more than leather. The stretch is approximately six per cent. as against four per cent. in leather; but once well at work, they give less trouble, as there is but one joint to look after. If put on really tight enough, this stretching is minimized to a great extent. Users are afraid to overstrain the belt, but the extraordinary result attained by certain experiments made as to tensile strain, shows the impossibility of breaking a belt under fair conditions."

GRAIN ELEVATORS, THEIR CONSTRUCTION AND FIRE HAZARD.

In the nature of business, strictly speaking, there is no specific fire hazard in grain elevators. The hazard is general, such as is incidental to all large manufacturing establishments, viz: Lack of order and cleanliness, oily waste, heated journals, boilers, open lights, defective lanterns, and other things of a kindred character. In fact, we would undertake to say that there never was an honestly constructed elevator destroyed by fire originating therein (except from incendiarism) which did not occur from some perceptible cause which any intelligent system of inspection would have detected prior to the occurrence.

For the purpose of obtaining the most practical views on their proper construction, as well as to determine the actual fire hazard, the views of many practical elevator owners and builders have been asked and information has been obtained which is herewith presented. For much of the information given, thanks are due to Messrs. J. T. Moulton & Son, Grain Elevator Architects, Contractors and Builders, of Chicago, whose experience is probably more extended than that of any other house doing a like business in this country; the Union Elevator Co., of St. Louis, through their efficient Superintendent; to Messrs. Carrington and Co. of Toledo; Messrs. Grier & Co., Peoria, and Messrs. Muller & Worcester, of Detroit, together with the enlarged experience of their secretary. For the detailed information respecting the separate elevators, thanks are solely due to Mr. Wm. P. Asten, Inspector of the Mutual Fire Insurance Co.

Grain elevators are usually constructed of wood, and as a precaution against fires from the outside, are covered with either iron, tin, slate or other non-combustible material, and sometimes inclosed in walls as high as the eaves of the main roof. The use of brick coverings outside is preferable in all cases, but of course, is much more costly. It is not impossible to build grain elevators of entirely fire proof material. There have been however, but three entirely fire-proof elevators ever built, the reason operating against their construction being the extra strength required in the foundation to carry the increased weight of such fire-proof structures. As a rule it is possible, by expenditure of sufficient money, to get a suitable sufficient foundation, so that this reason resolves itself finally into the second or main reason, to wit: That the cost of a fire-proof grain elevator would be at least fifty per cent. greater than that of a combustible structure such as is usually built. Of any form of building material, wood is the most easily obtained and can be worked into shape for building more readily, at the same time giving the necessary strength; besides its use as a building material is more generally and thoroughly understood.

Apart from the strictly fire-proof elevators, the ones best calculated to withstand fire from without would be inclosed with 12-inch brick walls as high as the eaves of the main roof. The fact that the Central Elevator "B," of Chicago, was thus inclosed, certainly saved it from destruction at the time of the "big fire," for had it not been so inclosed the heat from the burning of the Central "A" would have surely communicated fire to it.

The boiler and engine rooms should be built of brick, with iron roof on iron supports and be used only for the purpose the name would indicate. The wall next to the main building should be solid, with openings for engine shaft only. The stack should be of brick, and extend from thirty to fifty feet above the roof of adjacent buildings, and should be built with the view of securing an equal draft from each furnace through underground passages, instead of the hazard of sheet-iron breeching, as is usual.

There should be a separate and distinct fuel house, constructed of brick and iron, situated a safe distance from the boiler house and elevator proper. The belt room should be of brick from basement to shaft floor, and all openings provided with two-inch battened doors covered completely with tin, nailed under concealed joints, with nails at least one inch long, and hung with strap-iron hinges bolted through and through, and hooked into solid brick wall.

To prevent the occurrence of fire in grain elevators, the first and most important rule should be to keep the elevator clean. Constant sweeping should be enforced when the elevator is in operation, and a thorough cleaning from top to bottom daily. In all large elevators one person should be employed as an "oiler," whose whole time should be given to attending to journals, as the universal belief prevails among the elevator men themselves that there are more fires originating in elevators from overheated journals, than from any other one cause. The oily waste used in elevators (as in all other buildings) should be deposited in self-closing fire-proof oily waste cans, when not in actual use, and removed from the building before closing at night. This would do away entirely

with the danger of spontaneous combustion. Metal drip pans should be provided for all important journals.

Notwithstanding a difference of opinion as to the value of mercurial alarms being attached to all important journals, the writer has invariably recommended them, believing they were an additional safeguard, if nothing more.

All elevators should have a watchman at nights, Sundays, holidays and other times when the premises are not in operation, and be kept under the surveillance of a time detector, watch-lock, or other device of that kind, to insure the fact that he was really watching and watching all parts of the building.

A general impression prevails among the elevator men, as well as others, that one pattern of lantern is just as good as another, so long as a high price is paid for it. The fallacy of this belief becomes apparent when it is known that the class of companies issuing textile manufactures only, attribute nearly \$3,000,000 of their losses (out of a gross loss of \$20,000,000) to defective lanterns. A lantern having a spring bottom or having a slide and catch, as well as those burning kerosene, should be prohibited in elevators. The proper lanterns for absolute safety are those having a strong, riveted guard, to open from the top, and the lamp itself screwed fast to the bottom. It should have a padlock fastening, and the key should be fastened with a seal in the office. This would prevent the danger of the watchman opening it or dropping it at a point of danger. Headlight oil, sperm or other animal oils are the only kinds which should be used in grain elevators.

The lighting of an elevator should be done by gas, but by all means have the gas jet inclosed in glass reflector boxes. Open lights of any kind should be strictly prohibited in grain elevators.

The danger from locomotives and boats is not very great, if the buildings are covered with some incombustible material, such as brick, tin, iron or slate. Locomotives should never be allowed to enter the building, as is sometimes done, and insurance companies in insuring them should introduce a clause in their policies to prevent it.

Owing to their great height and the rapidity with which they burn, ordinary workmen cannot be induced to fight the flames, which otherwise might be extinguished, unless adequate iron fire escapes have been provided, and the men educated to the fact that they have means of exit should the flames cut off the stairways. Without numerous iron fire escapes, all correspondents agree that hose are next to useless on the upper floors. One correspondent even goes so far as to recommend a fire escape every fifty feet, the entire length of the building, and of sufficient width for two firemen to work upon it in the event of fire.

An independent fire pump, with a 12-inch water cylinder, should be connected with a system of fire piping radiating in every direction throughout the building, with fifty-foot sections of 2½-inch linen hose (treated with paraffine to prevent mildewing or rotting) attached at intervals of about one hundred feet on pipes. Brass nozzles, couplings and valve fittings should be used to avoid corrosion and rust. It should be the rule in operating a grain elevator, that at stated intervals the fire signal should be given to the engineer, and water forced through the pipes and hose, to know that they are in working order. A private fire brigade should be established in every elevator, and have monthly drills. This would guarantee the shortest possible time in getting the fire apparatus into working order in the event of fire.

The location of casks containing fifty to one hundred gallons of water at intervals, one cask to not more than 2,000 square feet, with two to four 10-quart galvanized iron pails to each, in my opinion forms a cheap and effective remedy against many a fire. One bucket of water at the right time will stifle what might have been a large conflagration, if water had not been so convenient for use. One argument in favor of the cask and pail preventive is, that even a child or most ignorant laborer would have sufficient sense to apply them to use. Another argument in their favor is the speed with which the water can be brought into service. The few minutes after a fire starts that is absolutely necessary to send the signal to the engineer and get a pump to work, so that the water is forced through a long system of piping, would be sufficient at times to allow the fire to gain such headway that the water when it came to hand would be of no service. A few buckets from the cask of water while waiting for the pump would have done the work. The pails should be labeled, "Use only in case of fire," and the rule made that they should be used for no other purpose. The water in the casks should be made into brine by the addition of as much salt as the water will possibly take up in solution, to prevent freezing in winter, and to avoid foul smell in summer.

It is believed by the writer, and substantiated by a concurrence of views of the various parties whose opinions have been sought, that automatic sprinklers, as a protection against fire in elevators, form a more effective appliance than all other devices combined. The cost of sprinklers, including piping, valves and connections, at the present low price of pipes, is about \$4.25 for each ten feet square of surface, or say \$3,000 per elevator having a capacity of 1,000,000 bushels. By the introduction of automatic sprinklers fed by two reliable sources of water, the rates of insurance should be reduced at least twenty-five per cent., as was pledged by the Western Mutual Underwriters. The insurable value of an elevator of the capacity stated, when filled with grain, would not fall short of \$1,500,000. The average rate of insurance is, say two per cent. or \$30,000 per annum. Thus the saving in the cost of insurance for one year would more than equal the outlay of sprinklers and the danger of interruption of business by reason of fire, would be reduced to a minimum. Automatic sprinklers having come into such general use in the East, numerous inventions have been made covering the same general idea of quick action, and distributing the water only where there is fire.—From a pamphlet issued by the Mutual Fire Insurance Company, 155 Broadway, New York.

DESCRIPTION OF THE MANITOBA VIADUCT AT ST. ANTHONY FALLS.

The *Scientific American* publishes the following account of the Manitoba viaduct over the Falls of St. Anthony, which was written by the Rev. Dr. Hovey, of Minneapolis:

"When Father Hennepin, in July, 1680, came in sight of the cataract whose curling waters he named after his patron saint, he little realized the transformations that were to be made in the interest of commerce and manufacture. Natural changes have also taken place, by the recession of the falls, so that this glowing description would not now be recognized in its main particulars, although probably correct at the time. The hard Trenton limestone which underlies the district around St. Paul and Minneapolis forms the brink of the falls, resting, however, on a bed of white friable sandstone. The washing away of this crumbling substance has of late years been so rapid as to threaten the degeneration of the cataract into a foaming rapid. The height has thus been reduced from fifty to sixty feet given to it by Hennepin to thirty feet, as measured by Jonathan Carver a century later, and finally to fifteen in modern times. At an expense of a million dollars, the Government came to the help of the millers, and in 1876 constructed an immense dyke of concrete to support the natural stone ledge. This dyke is four feet thick, thirty feet high, and 1,875 feet long. Canals have been cut to supply the great flouring mills that stand, like so many castles, on the bluffs overhanging the Mississippi River. By this means some of them now command a fall of fifty feet, and by better economy of the water privilege it is thought that they might get a fall of seventy feet. And now, spanning the whole assemblage of cascades, dykes, islands, canals, mills and other objects of historical, scientific and commercial interest, stretches from bluff to bluff, the noble viaduct which it is my intention to describe. The urgent necessity for some such structure became evident more than three years ago, or about the time when Minnesota entered on its new era of extraordinary prosperity. Nineteen railroads now send out of Minneapolis over one hundred passenger trains daily; and more than two hundred and thirty thousand carloads of freight were shipped from here last year. The daily grist of the flour mill is enough to fill a train a mile long. Such an immense traffic demands corresponding facilities. Hence, although two of the railroads had already built bridges of their own, one below Meeker Island, and the other at Nicollet Island, the associated roads decided to build this viaduct, and also a grand Union Depot, to which all the roads should, by the charter of the Union Company, have equal rights and privileges. The estimated expense of this great work was \$3,000,000, which large sum was guaranteed by the Manitoba Railroad, under whose auspices it was begun and carried on. Several plans were suggested, but the one adopted was that offered by Col. Charles G. Smith, Chief Engineer of the Manitoba Railroad, who also advised that the most durable materials obtainable should be used. Accordingly the piers, whose foundations rest on the ledges, forming the river bed, are built of the gray St. Cloud granite, which is extremely hard and enduring. The material used above the springing line, which is four feet above the high water mark, is the magnesian limestone, known as Kasota stone, and that hardens by exposure to the atmosphere. There are 30,554 cubic yards of solid masonry and 18,000 cubic yards of stone filling, chiefly the common blue limestone from the local quarries in the vicinity. The viaduct crosses the river below the Falls,

partly in order that the piers might have a more solid foundation than could be readily secured above, and also—a fact to be appreciated by the traveling public—in order to enable tourists to enjoy the remarkably fine view, which is much better from below than from above. The total height of the structure is 82 feet, and the height above high water is 65 feet. The top is 38 feet wide, giving room for a double stone ballasted track, which is guarded by strong stone coping. About 800 feet of the viaduct are built on a curve of six degrees, of 996 feet radius, at its west end; the object of this curved diagonal being to exempt it as much as possible from danger by reason of the masses of ice that tumble over the Falls during the spring floods. Besides the iron bridge near the depot, there are twenty-three stone arches, resting on granite piers rising from the bed of the river. Four of these spans measure 100 feet each, sixteen measure 80 feet each, and three but 40 feet each; and the total length of the viaduct is 2,100 feet making it one of the longest structures of the kind in the world. The cost of the stone structure is \$650,000, to which may be added \$50,000 for the iron terminal bridge, making a total of \$700,000. This does not include the approaches, nor the right of way, which must add considerably to the expense, as the western terminus is among the mills. The eastern approach is through more open ground, crossing the campus of the University of Minnesota, and following the bluff line along the river. Work was begun on the viaduct in February, 1881, and it was completed November 22, 1883, without any special demonstration, beyond the crossing of a single train with the officials of the railroad and a few invited guests. After having crossed, these gentlemen then walked back to the center of the bridge, while the engine was driven past them at a speed of twenty miles an hour, as a partial test of the firmness of the structure. The ends of the viaduct were then fenced up, and no further tests will be made, nor any crossing allowed, until next summer when, the Union Depot having been completed, both will be thrown open to the general traffic as agreed. It should be added that the Union Depot will stand on the western bank adjacent to the elegant suspension bridge now joining together the two halves of Minneapolis, and of which its citizens are so justly proud. It will be arranged so that most of the tracks will run under the streets, instead of crossing at a grade, with the exception of those that may still run to several depots now in use. When these improvements shall have been completed, in the near future, it is doubtful if any other city can boast of finer approaches than these, or that will give strangers, on their arrival, a more favorable impression as to the attractions and commercial importance of the locality.

TRADES NOT GENERALLY KNOWN.—How many of the following names of occupations are known to any ordinary educated man? We take them from the Census Returns:—All rounder, barker, bat printer, battler, beer-breaker, beatster, blabber, black-picker, book-minder, bomb-setter, branner, brazil-maker, budget-trimmer, bull-dog burner, bullet-pitcher, busheller, butt-woman, button-up, camberel-maker, can-breaker, carriage straightener, cheeker, chevenor, churer, clapper-carrier, combwright, coney-cutter, crowder, crutter, cullett-picker, cut-looker, cut-jack-maker, dasher, dirt-refiner, doctor-maker, dog-minder, doler, duler, egger, fag-otter, faster, fire-beater, flat-keeper, fluker, foot-maker, forwarder, gin-maker, glan-rider, grafter, hackingman, hank-boy, horse-marine, hoveller, idle-back-maker, impression-maker, iron-bolster-maker, keel-billy, lash-er, learner, lurer, maiden-maker, marbler, moleskin-shaver, muck-roller, notch-turner, off-bearer, oliveman, orange-raiser, painted-front-maker, paste-fitter, patent-turner, peas-maker, piano-puncher, ponty-sticker, ransacker, riffler-maker, sad-iron-maker, scratch-brusher, shore-woman, sparable-cutter, spitch-dealer, spittle-maker, spragger, sprigger, swift-builder, tawer, temple-maker, tharne-maker, thimble-pickler, thurler, tingle-maker, toster, townsman, trowler, walk-flatter, westernman, wheel-glutter, whim-driver, whitster.—*The British Mail*.

In baking poor flour, Prof. Jago says that to insure good results the yeast must be pure, and probably the use of "fruit" or added sugar would be advantageous. The aim of the baker should, in fact, be to get his sponge raised under the condition least favorable to the decomposition of the starch by the active albuminoids. Among other methods suggested and used with such flours has been the addition of alum; this substance greatly diminishes the activity of the albuminoids. Lime water is equally, if not more, efficacious than alum and acts in the same way, preventing the change of starch into gum and sugar, but scarcely interfering with the yeast fermentation.

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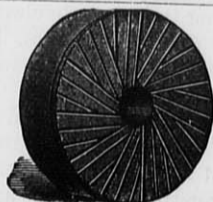


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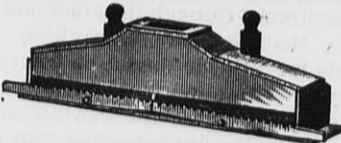
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TRAIN THE HANDS AS WELL AS THE INTELLECT.

An eloquent plea for industrial education in connection with the public-school system as it now exists was made recently by Superintendent James MacAlister in the Spring Garden Institute Hall, before a large audience. He said that the present conventional system is a one-sided education, but to make a boy's education complete, he needs, in addition, industrial education to fit him for the actual work of life. The present is an industrial age, and men must be trained for the vocations which have grown out of the immense industrial resources of modern times. Of the 100,000 pupils now in the public schools in this city probably very few will take up professional pursuits; the larger number will most probably find their way into the workshop, and it is not right to send these children unequipped into the world. The public school is for the masses, and is founded on the idea of the greatest good to the greatest number. Technical schools are much needed in America to qualify her for a higher position in the industrial world. Of the \$733,239,732 exported from the United States for the year ending June 30, 1882, only \$106,000,000 was for manufactured articles, the rest being food products and raw materials. Of her imports of \$724,000,000 she imported \$250,000,000—more than double her exports for manufactured articles.

England, in 1882, exported manufactured goods worth \$800,000,000, and France exported \$350,000,000. These figures, he said, prove that we are exporting raw materials and importing brains. America needs to put into her iron and steel the culture of the mind. The speaker claimed that industrial education will elevate the laboring classes, and is a much better solution of the labor problem than the socialistic remedy that some have proposed. He then described the high advance in education—industrial and intellectual—attained by the little Duchy of Wurtemberg, and also little Switzerland, which holds her own against all Europe, and which sends out products which protection cannot protect against, and which no tariff can keep out. Sweden, Holland, Denmark and France are all moving along the industrial line, and the United States must look well to these facts if she is to attain supremacy. There are only two public schools of this kind in this country—one at Boston and the other at St. Louis—the latter doing most valuable work for the youth of that city. Philadelphia, he thought, was ripe for such a system; she has the material at hand, and all that is needed is organization. He hoped that a technical school might be founded here in such a way as to be a parent to other similar enterprises to follow. Such a school could be established for \$100,000, that is, \$25,000 for the ground, \$50,000 for the building, and \$25,000 to stock it with tools and appliances. The merchants and business men in St. Louis put their hands in their pockets and established the school there, and \$100,000 was recently raised in Chicago for a similar establishment.

At the close of the lecture the large audience visited the schools of the institute, where the pupils were at work.—*Journal of Progress.*

IN CASE OF ACCIDENT.

Bruises frequently follow falls and blows with stones and missiles, or may be quite serious in their nature, even though the outer skin may not be broken. The swelling which usually follows a bruise sometimes conceals a fracture, or a severe injury to the soft tissues. The immediate application of cold water, ice or some evaporating lotion, such as water of ammonia, camphor, weak tincture of arnica, etc., is the best treatment for alleviating pain and hastening the absorption of the effused blood.

In an age when nearly everything is done by machinery, accidents from this source are of frequent occurrence. Fingers may be cut off, limbs crushed, skin and muscles torn, etc., rendering immediate aid necessary to prevent the person from bleeding to death. In case of hemorrhage from any limb or part, follow the instructions given in the preceding paper. After the bleeding has been arrested, apply clean linen or cotton pads wet with cold water, and bandage lightly, to support the wounded limb or muscle.

The flashing of loose powder, the explosion of fireworks, the bursting of powder flasks, guns and small cannon, give rise to accidents more or less serious. In many cases the treatment of such injuries differs little from that of ordinary burns, except where powder has been blown into the face, when an effort should be made to remove it. In case of hemorrhage, stop it as soon as possible by means of cold applications, ligatures, bandages, etc., as previously directed. If fingers or limbs have been blown off, draw the surrounding tissues together, and cover the wound with linen or cotton cloth saturated with clean water.

In case of gunshot wounds, the treatment depends upon the extent of the injury. A

rifle bullet, a charge of shot or a blank cartridge will produce different effects, depending upon the distance from which they were fired. At short range, the bullet and shot make a similar wound; at a longer distance the shot scatters and make several small wounds. When fired at a short range, a blank cartridge makes the ugliest kind of wound, because both the wadding and powder enter the flesh and tear up larger surfaces.

Where a bullet, shot, or some wadding has entered the body it is necessary that it should be extracted. But this is a task that had better be left to the physician. The immediate treatment of gunshot wounds, however, should be similar to that of the wounds described. Stop the hemorrhage, if any, and cover the wound with cloth wet with clean water.—*Dr. Sargent in Wide Awake.*

CHEMICAL CHANGES IN DAMAGED GRAIN.

A quantity of barley which had been subjected to a continuous rain for about two weeks during harvest time, and which, in consequence, had germinated somewhat, was dried, and a sample sent to Prof. M. Maereker, of Vienna, together with a sample of barley from the same field which had been harvested in a good dry condition. A careful comparative analysis was made, with the following result: The common food analysis did not show any appreciable difference between the two samples, but in the determination of matters soluble in water the results were very striking, and proved that during the germination process a very energetic diastatic action takes place in the grain, which converts the starch and dextrine into sugar. The analysis proved that the quantity of starch had, in this manner, diminished considerably, in part by its conversion into soluble dextrine and in part by a production of carbonic acid. Aside from such direct loss, the grains contain a large amount of diastase, which, in the course of the manufacturing process, will tend to transform an additional amount of starch into dextrine and sugar; and the quantity of starch obtained from such damaged grain must be considerably below the average. But the most pronounced changes in the damaged grains were found in the nitrogenous compounds. Accepting the whole of these compounds as 100 parts, then the soluble albumen, which in the good barley consisted of 4.6 per cent. of these 100 parts, was reduced to 1.8 per cent. The insoluble albumen, which in the normal grain consisted of 91.5 per cent. of the nitrogenous matter, had undergone a reduction of 20.6 per cent. in the damaged sample; but the amides, the ammoniacal compounds, had increased at the same time from 1.5 to 22.2 per cent. of all the nitrogenous compounds. The power to germinate, of which a mean of 98 per cent. was obtained in the normal sample, was reduced to 45 per cent.—*Brewers' Guardian.*

BELTS AND VALVES.

BY E. A. KIMBALL.

It seems unaccountable that a scientific man, or in fact any practical man should argue in favor of running a leather belt with the flesh side on the pulley, but for a long time that was the general custom, and those who had seen them running that way all their lives objected to any change, principally because a belt looks better with the smooth side out, hence if they found one running the other way would turn it to suit this notion. One of the veteran manufacturers of leather belts (now deceased) stamped on the hair side of all his belts, "Run this side on the pulley," but the force of habit was too strong in many cases, and this caution went unheeded.

It is generally admitted that the smoother the surface of a pulley is, the closer a belt hugs and the more effective it is; this being so why does not the same principle apply to belts. The smoother the surface of the belt the more perfect the contact, and as a matter of course the greater the friction and the more work it will perform. Yet we have heard very scientific men strenuously argue to the contrary, but whether for the sake of controversy, or from a sincere belief that it is so, may be left for conjecture.

Another absurdity needs to be spoken of, and that relates to the manner of placing steam valves. A great deal of steam fitting is done by thoughtless and incompetent workmen, and of course without any system. We have found in large establishments where an enormous number of valves were in use that some of them were placed at one end to the steam and others the opposite way. In not a few cases we have found them all placed so that the steam entered against the under side of the valve, so that when the valves were closed the pressure of steam was constantly against the valve tending to force it open and causing it to leak. The proper way is to allow the steam to enter in such manner as to press down the valve which, when closed, the pressure of steam helps to hold down. It is urged as an objection that it is hard on the valve to open it against the pressure of

steam, but this has no force except while the valve is closed, for the instant it is opened the pressure is alike on both sides, or so much more on the under side as the area of the valve-stem on the upper side. Thus there is no force nor reason in any argument for placing the under side of the valve to the steam entrance.

One of the outrages on consumers is the placing of inferior and imperfectly made steam-valves on the market. There ought to be a penalty in such cases. A leaky valve is an abomination. Reliable valves should be ground to seat and the stuffing boxes packed and ready for use.—*Industrial World (Chicago.)*

NUTRITIOUS QUALITIES OF VARIOUS FOODS VARIOUSLY COOKED.

The world little imagines how largely it is indebted to the laborious researches of scientific medical men for many of the most important truths relative to human health, happiness and life. As population increases and the value of food is enhanced, the knowledge which chemistry has elicited is becoming more and more valuable in a practicable point of view.

Some kinds of food are more nutritious than others, and if it should be found that articles which are cheapest have the most nutriment and give the highest ability to labor, then knowledge becomes money to the poor. Tables vary, but some of the general results are as follows: One pound of rice, prepared for the table, gives 88 per cent. of nutriment, and consequently a relatively proportional ability to labor, compared with other articles of food. A pound of beef, costing 15 cents, gives only 25 per cent. of nutriment. Yet countless numbers of the poor in New York strain a point daily to purchase beef at 15 cents a pound when they could get a pound of rice for one-third of the amount, the rice, too, having three times as much nutriment as beef, making a practical difference of 800 per cent., aside from the fact that boiled rice is three times easier of digestion than roast beef, the rice being digested in about one hour, roast beef requiring three hours and a half. There is meaning, then, in the reputed fact that two-fifths of the human family live on rice.

We compile the following tables for preservation, as being practically and permanently useful. All the economist requires is to compare the price of a pound of food with the amount of nutriment which it affords:

Kind of food.	Mode of preparation.	Percentage of nutriment.
Oils.....	raw.....	95
Peas.....	boiled.....	93
Barley.....	boiled.....	92
Corn bread.....	baked.....	91
Wheat bread.....	baked.....	90
Rice.....	boiled.....	88
Beans.....	boiled.....	87
Rye bread.....	baked.....	79
Oat meal.....	porridge.....	74
Mutton.....	broiled.....	30
Plums.....	raw.....	29
Grapes.....	raw.....	27
Beef.....	raw.....	26
Poultry.....	roast.....	26
Pork.....	roast.....	24
Veal.....	fried.....	24
Venison.....	broiled.....	22
Codfish.....	boiled.....	21
Eggs.....	whipped.....	13
Apples.....	raw.....	10
Milk.....	raw.....	7
Turnips.....	boiled.....	4
Melons.....	raw.....	3
Cucumbers.....	raw.....	2

—From the Journal of Health.

NONSENSE.

LAST IN BED BLOWS OUT THE LIGHT.—Old Uncle Ploughgit and his wife were holding a sort of love feast the other night, recounting old times. As the worthy couple slowly prepared to retire they went over the days gone by in a highly entertaining manner.

"Do you know, 'Riah, I feel just as young as I ever did?" said Uncle Ploughgit, exuberantly.

"So do I, Enoch," sprightly responded Aunt 'Riah.

Then a thought suddenly occurred to Uncle Ploughgit, and wheeling on his heel he cried out:

"Last in bed blows out the light!" and made a plunge for his side of the couch. His wife, though taken by surprise, was nothing behind him in sprightliness, and their aged heads met about the middle of the bed with a startling thump. Aunt 'Riah doubled up on the floor, and old Uncle Ploughgit, rubbing the top of his head, muttered, "What two durned old fools we be, anyhow."—*Detroit Free Press.*

ANECDOTE OF WEBSTER.—The amusing controversy and correspondence growing out of Secretary Marcy's court-dress circular when James Buchanan was minister to the court of St. James, described in an article on Buchanan in the January number of this magazine, reminds a correspondent of an occurrence that took place at Marshfield in Mr. Webster's time.

Mr. Webster and Judge Duane Doty, then of Green Bay, Wisconsin, were warm friends,

and the Judge at one time was a visitor at Marshfield. Mr. Webster was very fond of fishing—the only out-door sport in which he indulged. While the Judge was his guest it chanced that a fine day for this sport presented itself, of which Mr. W. was anxious to avail himself. He accordingly invited the Judge to accompany him in this piscatory sport. The Judge didn't want to go, and tried his best to get off, saying he would much prefer, with his consent, to pass that rainy day in Mr. W.'s library among his books and papers. Mr. W. wouldn't listen to him, said he could pass any and as many days in the library as he chose, but such a day as that for fishing might not occur again while they were at Marshfield. The Judge, as a last resort, said that he really could not go, as it would spoil his clothes, that the handsome black suit he had on was his best, and all he had, and that to go fishing in it would spoil it. To meet this objection Mr. W. directed his servant George to go up stairs and bring down the dress in which he was presented at court in England, which George did. As soon he appeared with it Mr. W. said, "There, Doty, is a dress for you; put it on, and come as soon as you can, for we are losing valuable time."

The Judge replied: "Surely, Mr. Webster, you are not in earnest in what you say—that you want me to go fishing in that elegant suit, and spoil it?"

"Yes, I am," he replied; "that is what it has been brought down for."

The Judge still lingered, when Mr. W., to settle the matter, said to him: "Have no anxiety about injuring the dress, for to fish or hunt in it is the only way it can now be made useful. Could I wear it in Washington, Philadelphia, New York, Boston, or even here? If I did, wouldn't everybody laugh at me?"

The Judge was compelled to answer affirmatively to the question.

"Well, then," he said, "pray what is it good for but to go fishing in?"

This settled the matter. The Judge put on the dress, and went fishing in Mr. W.'s court suit, and saved his own. Thus, you see, Mr. Webster, with his well-known willingness to oblige, had no objection to appear before England's Queen in the dress prescribed; and what a good use he made of it after his return home!—*Editor's Drawer, in Harper's Magazine for April.*

"Mr. Smith, do you know the character of Mr. Jones?" "Wal, I rather guess I do, judge." "Well, what do you say about it?" "Wal, he ain't so bad a man after all." "Well, Mr. Smith, what we want to know is, is Mr. Jones of a quarrelsome and dangerous disposition?" "Wal, judge, I should say that Tom Jones is very vivid in verbal exercise, but when it comes to personal adjustment, he hain't eager for the contest."

Deacon Dewgood's son returned home very late the other night from a very pressing engagement with his pretty sweetheart. "Where have you been?" growled the old man, as the youth came sneaking up stairs in his stocking feet. "Dear father," he replied, "I cannot tell a lie; I've been to a protracted meeting." And the good old man upbraided himself for having treated his son so harshly.

NOTHING TOO GOOD FOR HIM.—One day a gentleman who was speaking to Mr. Lincoln about Mr. Chase's political ambition, expressed surprise that the office of chief justice of the United States was not sufficiently high to allay the ambition of any man.

"Do you know Mr. Chase well, very well?" asked Mr. Lincoln.

"Yes—I think so," somewhat doubtfully replied the other.

"Well," rejoined Mr. Lincoln, "let me tell you about Mr. Chase. He is a man, if he is happy enough to go to heaven, will certainly aspire to a seat on the throne."

A RATHER SOLEMN BEGINNING.—An absent minded clergyman, when a couple called on him to be married, began to read the burial service, beginning, in a solemn voice:

"Man that is born of woman is of few days, and full of trouble."

The bridegroom interrupted the minister, telling him of the serious mistake he had made.

"Well," was the reply, "if you insist upon it, I will marry you, of course, but, believe me, you had better let me go on and bury you."

A QUEER CALL.—A lady was telling a very funny story anent the entertaining of Lord Coleridge by George W. Childs, of this city. Mrs. Childs, wishing to have his Lordship's title duly honored, coached the servant and charged him to say, when awakening his Lordship in the morning: "My Lord, it is time to arise." But the servant failed in distinctions, and rapping at the guest's door, shouted: "My God, it is time to 'get up.'" Imagine the expression maternal on the Lord's face!—*Philadelphia Paper.*

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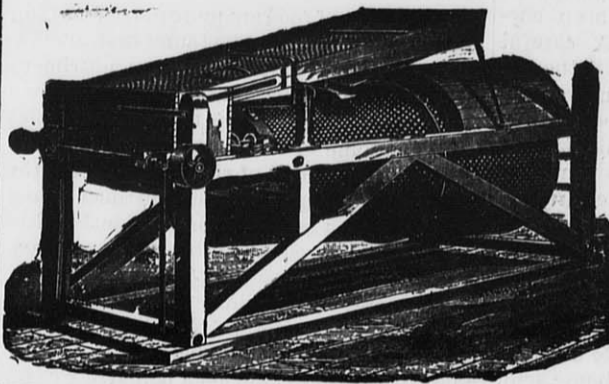
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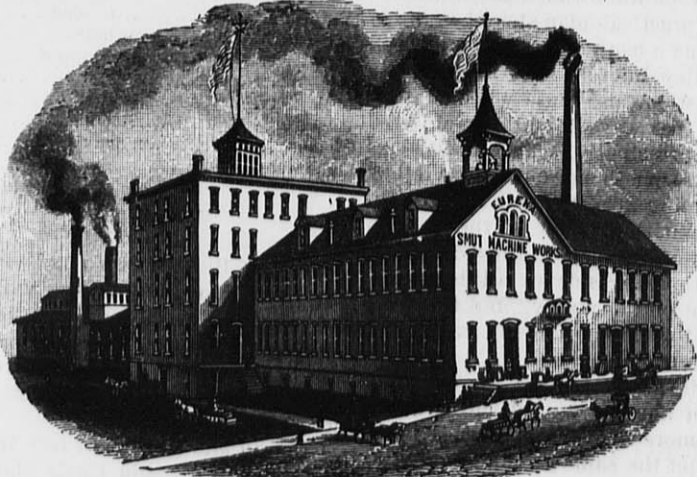
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MILL SITE I offer for sale cheap my mill site with a good solid dam and race, 35 acres of good land with two dwellings thereon, 3½ miles from Red Wing, in Goodhue County, Minnesota; plenty of water, with a 32 ft. head. Good location for custom work and home market. This is the best mill location in the county. Address, J. BOHMBACH, Red Wing, Minnesota. [May]

PARTNER WANTED To put in the Roll-or system, in what is now a first-class 3-run Water power Custom and Merchant Mill. Building of stone 32x44 ft., three stories besides basement and attic. Best built mill in the state for its size; never failing Water power; delightfully located in a village near R. R. station, at outlet of lake 3 miles long 1½ wide, with a river running through it. Can buy abundance of choice wheat at mill door, so as to be able to deliver flour in Milwaukee at 30 cents per barrel less than Milwaukee mills can produce it. Good run of Custom, and ready sale for all offal and feed at retail prices. To the right man a bargain will be offered. For further particulars address in sealed envelope, MADISON H. BUCK, Delafield, Waukesha Co., Wis. [May]

SAXTON & THOMPSON'S MILL AT LOCKPORT, N. Y.

We take the following description from the *Lockport (N. Y.) Daily Journal* of March 22.

One of the leading manufacturing firms in this city, and yet one of the most quiet and unostentatious in the place, is the milling firm of Saxton & Thompson, owners of the valuable milling property on Market Street just north of the Central railroad tracks. The mill was formerly known as the Douglas Mill, and was purchased of Asa W. Douglas, of this city, a number of years ago, by the above named firm. It was at that time a first-class mill of its kind, being 76 feet wide, 140 feet long, seven stories high, and solidly built of stone, having a very valuable water power. Saxton & Thompson have since made numerous improvements upon the mill until it has reached a capacity of 400 barrels a day, being what is called a mixed mill, running stones in part and rolls in part. Mr. S. B. Saxton, the senior member of the firm, a very energetic and able business man, with plenty of capital, determined recently upon making very extensive and decided improvements to the property, which would make the mill rank A 1 in the milling world; that is to say, in the quality of its work, and at the same time would more than double its capacity.

The first step in this direction was the building last summer of an additional story to the structure, handsomely covered with a mansard roof, adding greatly to the appearance of the building. This being completed, he entered into negotiations with a large number of manufacturers of mill machinery, for the thorough refitting of the mill with the latest and most approved mill machinery known, which should also increase its capacity to a thousand barrels per day. The John T. Noye Manufacturing Company, of Buffalo, was successful in receiving the contract, which stipulated that the entire work must be completed between March 1, and June 1, 1884. The old mill was to be entirely renovated, in fact all the old machinery was to be entirely removed with one or two minor exceptions. Some of the above facts coming to the ears of a reporter of the *Journal*, to-day he investigated by going to the mill, which he found had been shut down after working up all the stock, and was in the busy hands of the workmen, forty-one in number, who were at work this morning on the improvements, and the force will be doubled next week. At present they are engaged in removing the old machinery and fixtures. Mr. S. B. Saxton of Troy, N. Y., the senior member of the firm, being himself present in the office, was interviewed by the reporter regarding the proposed improvements, and he very courteously answered all questions put to him. He stated first that the contemplated improvements outside and inside of the mill would cost a large sum, just how much he could not tell, but much greater than any of our citizens have any idea of, and when completed the mill would rank among the finest in the world.

The outside improvements were to be very extensive. First a branch track was to be run directly into the third story of the mill from the Central freight yards, entering by means of iron trestle work and wrought iron span bridges over the street and the hydraulic race. The first bridge over the race will be a span of 48 feet of wrought iron, the main span being 70 feet over Market street. These bridges are to be built by the Groton (N. Y.) Bridge Company. The tracks laid on these bridges will be doubled at the mill, allowing the introduction of machinery whereby the cars can be shifted immediately from one track to another as fast as they are loaded. Fairbanks & Co. will also build a first-class set of standard railroad track scales thirty-four feet in length in the mill, upon which cars will be weighed. Another great improvement will be the substitution of an iron trestle work in place of the wooden one used at present for farmers to drive upon to discharge their loads, and in this connection it may not be out of place to state that the elevators will be greatly increased in convenience and capacity, making it possible to unload three wagons, two freight cars and a canal boat, all at the same time. The boat elevator will have a capacity of 1,500 bushels an hour. The car elevators 1,000 bushels per hour and the three wagon elevators, 800 bushels per hour, making the total 3,300 bushels of wheat, which can be taken into the mill every hour.

The increase of water power is another important consideration, although this portion of the work as well as the new elevators is a part of the contract of the Noye Manufacturing Company. The present power is derived from a wheel at a fall of 25 feet, but the new power will be obtained from two Hercules wheels placed at the bottom of the wheel pit, giving 50 feet fall, and as a result a largely increased power, estimated at seven hundred horse power. These wheels will be so arranged that only the smaller ones can be run when there is low water or the full working force of the mill is

not desirable. Now we come to the new machinery, which will consist of the following complete apparatus for manufacturing the very best grades of flour:

The storage capacity will be 125,000 bushels of wheat, to be contained in four bins now built, which will hold 20,000 bushels, and in eighteen new bins each seventy feet deep, holding 5,000 bushels each. There will be seventy-six pairs of rolls, entire sets of new bolting chests, consisting of eighty-four reels. The complete cleaning apparatus, furnished by the Richmond Manufacturing Company of this city, will probably be used. Ten centrifugal machines, five runs of 48-inch stones will be retained and replaced on the Noye iron hurst frame, five flour packing machines, twenty George T. Smith purifiers, made at Jackson, Mich., two magnetic separators, for extracting all wire or metal from the wheat, four Kurth cockle machines, eight Richmond bran dusters, made in Lockport, and twenty-five dust collectors. This makes a mill unequalled for completeness in this part of the State and it is a high tribute to the quality of Niagara county wheat that it is to be built, as on asking Mr. Saxton why he made this large increase in his mill and where he expected to get all his wheat from, he said he expected to get most of it in Niagara county, as he had found that our winter wheat equaled any in the market for manufacturing the highest grades of flour. It was, he said, fully up to the boasted "No. 1 hard" spring wheat of the Red River Valley. The fine water power here and the shipping facilities have made this as desirable a place to manufacture flour as he could find. He said he expected to employ about 25 men when the new mill was completed. The new mill will be in charge of Mr. Robert Adams, the head miller, a gentleman of large experience and eminent capability for the position. Mr. Charles T. Raymond is the book-keeper of the mill, and Mr. W. D. Smith is the shipping clerk. Both are courteous, and capable young gentlemen.

The mill is now in the hands of the Noye Manufacturing Company, the work being under the superintendence of Mr. M. W. Holt, of that company, the immediate supervision of the men being in the competent hands of Mr. J. M. Duncan, of Buffalo. The gentlemen last named are confident that they will have the mill in running order by the first of June, and as they are gentlemen of experience in this business, they are to be believed. They also state, without a desire to boast, that no better flour mill can be found in the world than the Saxton & Thompson mill will then be.

Our citizens are to be congratulated upon such an accession to our manufacturing industries, and to the firm at the back of the work, Messrs. Saxton & Thompson, no small amount of just praise and gratitude is also due.

[Written for THE UNITED STATES MILLER.]

THEORY OF THE CENTRIFUGAL PUMP.

Of the total work employed in producing rotation, that portion which represents the force in the normal or the centrifugal force is that alone which under all circumstances can become "duty" in the centrifugal pump.

Generally—

Let G = the weight of a revolving body; and hence its mass $M = \frac{G}{g}$, g having the usual relation to gravity.

r = the radius of revolution.

v = the velocity of revolution in the circumference.

P = the force in the normal, or the centrifugal force.

Then $P = \frac{M v^2}{r} = \frac{G v^2}{g r} = 2 \frac{v^2}{2g} \frac{G}{r}$; hence $P : G :: 2 \frac{v^2}{2g} : r$

That is, the centrifugal force is to the weight of the body in revolution as twice the height due to its velocity is to the radius of revolution.

The resistance being uniform, we may express v in terms of the time of revolution T with the radius r , and

$P = \left(\frac{2 \times 3.14}{T} \right)^2 \frac{M}{r} = \frac{4 \times 3.14^2}{T^2} M r = \frac{4}{g T^2} G r$; and as the constant $4 \times 3.14^2 = 39.4784$,

$P = \frac{39.4784}{T^2} M r = 1.224 \times \frac{G r}{T^2}$

or, if n = the number of revolutions per minute, so that $T = \frac{60}{n}$, then

$P = \frac{39.4784}{3600} n^2 \times M r = 0.010966 n^2 \times M r$, or $P = 0.000331 n^2 \times G r$.

Lastly, as $\frac{2 \times 3.14}{T} = w$, the angular velocity, $P = w^2 \times M r = w^2 \times \frac{G}{g} r$.

These various expressions for P become convenient for all calculations in which centrifugal force enters.

Where the revolving body is a fluid, and a particle whose weight is G is transferred by the normal force from the axis of rotation to

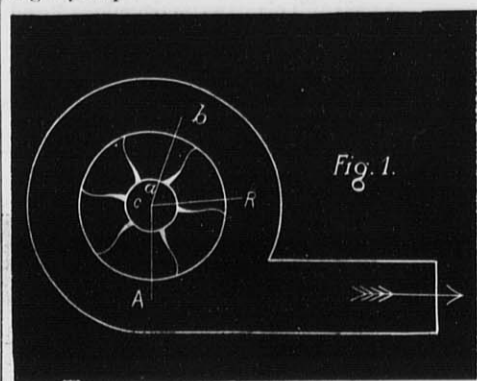
the extremity of the radius r , then the work done, L , is—

$$L = \frac{w^2 r^2}{2g} \times G = \frac{v^2}{2g} G,$$

v being the velocity of rotation at the extremity of the radius r . Or if the particle start not from the axis, but from some intermediate point in a radius, then

$$L = \left(\frac{v_2^2 - v_1^2}{2g} \right) G.$$

In a case of a properly proportioned centrifugal pump



Let $CR = r$,

v_1 = the surface velocity of the vanes, which must be proportioned to

H = maximum dynamic head of water to be overcome, and which consists of

z = the elevation to which the water is to be delivered from the lower level;

h = the height due to the velocity of delivery.

h_1 = the head lost in overcoming resistances in the machine.

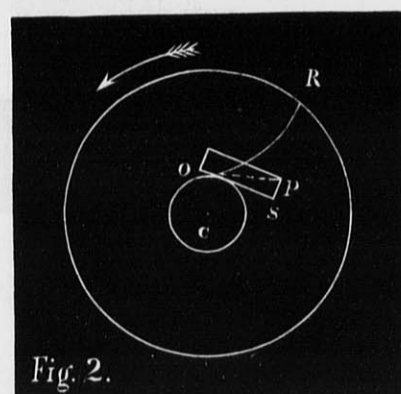
Then $\frac{V_2^2}{g} = H = z + \frac{V_2^2}{2g} (1 + Sf)$;

V being the velocity in the ascending main of the pump, and Sf the sum of the several resistances; and the surface velocity of the blades is

$$v_1 = \sqrt{\left(g z + \frac{V^2}{2} (1 + 0.025 \frac{z}{d}) \right)}$$

d being the diameter of the pipe when it is wholly vertical, and therefore its length $l = z$; but when otherwise for $0.025 \frac{z}{d}$ we must substitute $0.025 \frac{l}{d}$.

Let d_1 = the diameter of the ascending main, be taken as unity. Then in proportioning the pump, let the external radius of the blades, CR , (Fig. 1), $= \frac{7}{4} d$; the radius of the ears of the pump $= \frac{3}{4} d$; and the diameter of each of the indraught passages $= d$. The breadth of the blades $= \frac{3}{4} d$ nearly and the mean radius of the casing pump $= \frac{7}{4} d \times \frac{v_1}{V}$.



The fan-blades should be perfectly radial at the outer extremity, and for at least one-half their length. The inner portion should be curved, as in Fig. 2, forwards in the direction of revolution of the fan, and should so reach the inner edge of the revolving disc of blades, that the angle $p o s$, $= b$, should be

$$b = \frac{v_0}{V_2}$$

V_0 being the radial velocity of the water, and V_2 being that of the inner edge of the fan-blade.

As regards the power required to drive a centrifugal pump, and to raise per minute a given weight of water, W , it may be taken at

$$2 W \left(z + \frac{V_2^2}{2g} (1 + 0.025 \frac{1}{d}) \right)$$

for very few such pumps in reality return in duty more than fifty per cent., and the great majority far less.

WHAT RIGHTS HAVE INVENTORS ANYWAY?

One would think from the recent action of the U. S. House of Representatives that an inventor was almost as bad as a criminal and had no rights worth consideration. For instance, to quote from the *Scientific American* which journal is ably fighting the cause of inventors: House bill 3,925, introduced by Hon. Mr. Calkins, of Indiana, provides substantially that if the inventor or owner of a patent shall dare to attempt to sustain his rights by bringing a suit against infringers, he shall recover no costs and shall pay to the infringer's lawyer a counsel fee of \$50. This bill was passed in the House of Representatives by an enormous majority, on January 21, and is now before the Senate for con-

currence. The members who voted for it apparently regard it as a very upright proceeding to encourage the inventor to reveal his invention by passing laws to give him a patent, and then passing other laws to deprive him of the benefit of said patent. This is the way Congress exemplifies integrity and fair dealing before the people.

House bill 3,934, introduced by Mr. Vance of N. C., provides substantially that any person may use any patented article he pleases without liability, but shall become liable after receiving notice that a patent exists; and may then require the patentee to give him the use of the patent for a royalty to be named by the courts, thus robbing the patentee in the first instance and then depriving him of the control of his patent. The bill was passed by the House, January 22, 1884, by a vote of 114 ayes to 6 noes.

House bill 3,617, introduced by Mr. Anderson, of Kansas, reduces the lifetime of a patent from 17 years to 5 years. Not yet passed, but perhaps soon will be by a great majority, as there is no member in the House who has so far ventured to say a word in protest or speak in favor of inventors or the present patent system.

In the Senate the bill introduced by Mr. Voorhees, of Indiana (S. 1,558), provides in effect that all patents shall be free to the public. This bill caps the climax; it has not yet passed; but soon will be if the members of the Senate share in the views of the House majority.

The following is the text of Senator Voorhees' bill:

S. 1,558. "Be it enacted, etc.—That it shall be a valid defense to any action for an infringement of any patent or any suit or proceeding to enjoin any person from the use of a patented article, that the defendant therein, or his assignor, purchased the patented article for use or consumption, and not for sale or exchange, in good faith and in the usual course of trade, without notice that the same was covered by a patent, or without notice that the seller had no right to sell such article; and in all such cases notice received after such purchase shall not have the effect to impair in any way the right of such purchaser as absolute owner."

We hope that all these bills may be defeated, for there is nothing that we can think of, that has done more to develop our country than useful inventions. Inventors are stimulated to spend time, money and brains to perfect inventions because they know that if they succeed in producing a new and useful machine or article or discover a new method of doing something better or more economically than it was done before, they are under the present patent laws sure of a reasonable reward.

Wise men and distinguished legislators from time immemorial have had high regard for inventors. The great Lord Bacon wrote more than two centuries ago as follows:

"The introduction of great inventions appears to hold by far the first place among human actions, and it was considered so in former ages; for to the authors of inventions they awarded divine honors, but only heroic honors to those who did good service in the State (such as the founders of cities and empires, legislators, deliverers of their country from long endured misfortunes, quellers of tyrannies, and the like). And certainly, if anyone rightly compare the two, he will find that this judgment of antiquity was just, for the benefits of inventions may extend to the whole race of man, but civil benefits only to particular places; the latter, moreover, last not beyond a few ages, the former forever. The reformation of the State in civil matters is seldom brought about without violence and confusion, while inventions carry blessings with them and confer benefits without causing harm or sorrow to any."

It will be well for manufacturers, inventors and every one interested in the welfare of the country to write to the senators from their states remonstrating against this most unjust legislation. It may be that there are some things in our patent laws that it would be well to change but better a thousand times to let them stand as they are than to enact such laws as are indicated in the above bills.

AN ELASTIC LACQUER.—Van Nostrand's

Magazine says a lacquer of great elasticity, perfectly supple, and not liable to peel off, is made in the following manner: About 120 pounds of oil varnish are heated in one vessel and 33 pounds of quicklime are put into 22 pounds of water in another. As soon as the lime causes an effervescence, 55 pounds of melted India-rubber are added. This mixture is stirred and then poured into the vessel of hot varnish. The whole is instantly stirred so that the ingredients may become thoroughly incorporated. Straining and cooling complete the process. When required for use it is thinned with the necessary quantity of varnish, and applied hot or cold to wood, iron, walls, water-proof cloth, paper, etc.

ITEMS OF INTEREST.

UNCUT AMERICAN TIMBER.—According to the forestry bulletins, there was but about 82,000,000,000 feet of mercantile white pine standing in 1880 in the lumber States of Michigan, Wisconsin and Minnesota, and only about 35,000,000,000 long leaf pine in Florida, Georgia and the Carolinas. But the estimate of long and short leaf in Alabama, Mississippi, Louisiana and Arkansas, was above 131,000,000,000 feet and this reserve has scarcely been touched yet. Louisiana alone has 48,000,000,000 feet standing.

SOUTHERN CORN.—Dr. J. H. Hanaford, a well known authority, says: "It may surprise some who have given no attention to the subject to learn that Southern corn is

more nourishing and strengthening than the Northern, while the very ignorant in these matters will positively refuse to admit the fact. The reason which they will give that Northern corn will fatten their hogs the most readily, is among the most convincing in opposition to their theory. To make this plain, let it be remembered that there are three classes of food elements needed to sustain the human body; one to give muscle, strength and endurance—the "nitrates;" one to furnish the means of sustaining the system in the matter of heat and fat—the "carbonates," and a third to afford nourishment to the brain and nerves—the "phosphates." As we may infer—since the great and glorious Father does all things well—the Southern corn, in a milder

climate, contains less of the carbons, the heating and fattening element, the place of which must be supplied by other constituents, such as a population in a hot climate manifestly need.

INVENTOR OF THE BICYCLE.—A discussion has been going on in the pages of the *Scottish American Journal* respecting the question as to who is entitled to the honor of having invented the bicycle. In some parts of Europe the bicycle is becoming an important auxiliary of travel, and is regarded as the poor man's horse. By its aid many workmen are enabled to reside with their families in healthy rural dwellings, away from the moral and physical pestilence of the crowded cities, as they can travel cheaply and expeditiously to and from

workshops and factories in the manufacturing centers. From the evidence given regarding the early history of the bicycle, there appears to be no doubt, that Gavin Dalzell, of Lesmahagow, Scotland, invented and made a machine as early as 1845, which must be regarded as the prototype of the bicycle. The inventor was in the habit of riding the machine about the country, propelling it much in the same way as the bicycle is propelled to-day, and ample testimony is borne to the truth of the statement. Mr. S. W. Dalzell, assistant engineer on the Pittsburg division of the Pennsylvania Railroad, is a son of the inventor of the bicycle, and is ready to substantiate the claims made on behalf of his father. —*American Machinist.*



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NOTICE.

To the Members of the Missouri Millers' State Association:

For various reasons it has been deemed best to hold the regular annual meeting of the Association this year at Chicago, in connection with the meeting of the National Association, which is set for June, exact date to be fixed later, and the Chairman of the Executive Committee instructs me to make this announcement to the members.

DAVID B. KIRK, Sec'y.

A. BLOEDEL,

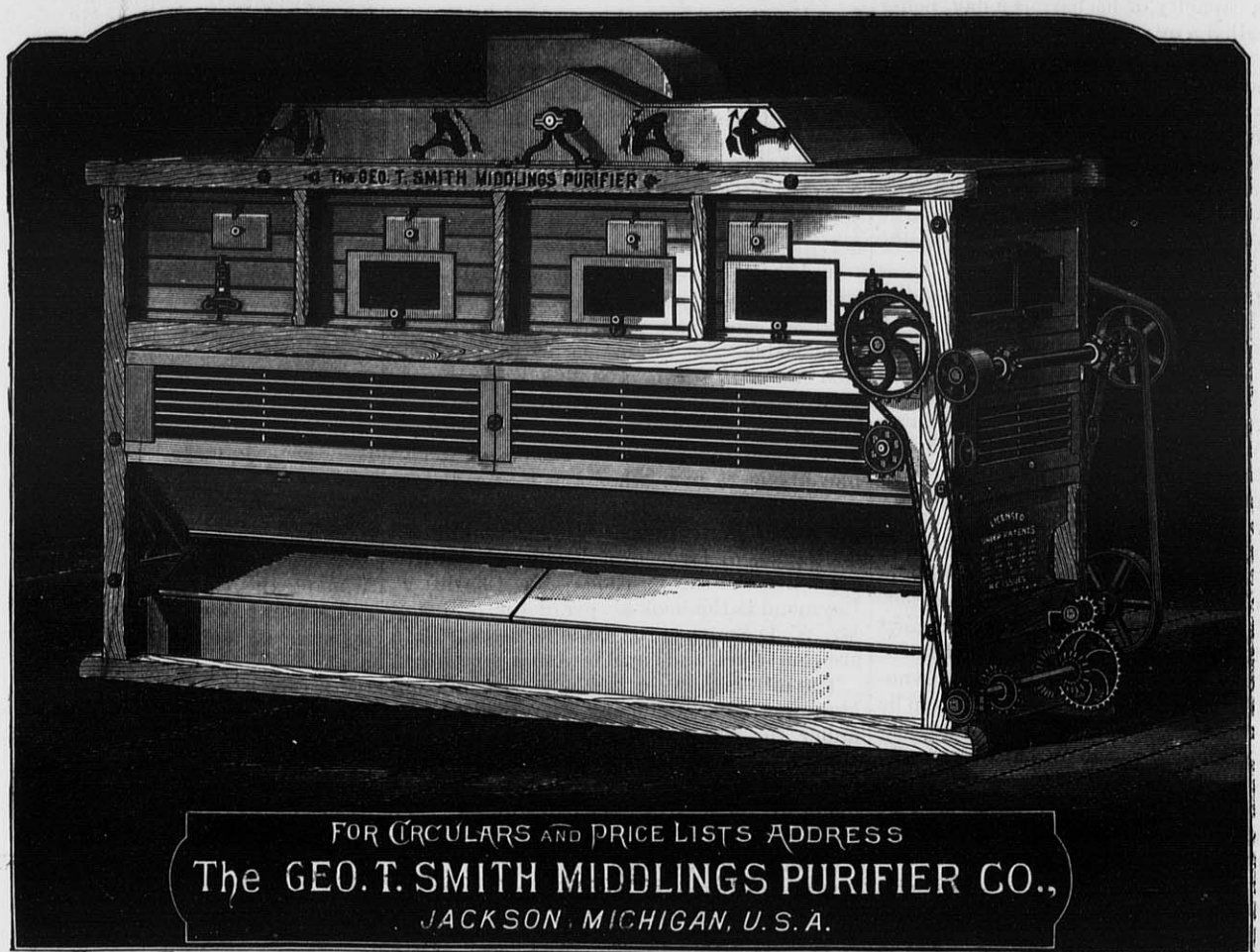
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Gentlemen:—In regard to the workings of our new mill erected by you, will say it is working fully up to and beyond our expectations. Our average work is fully 33 per cent. over your guarantee. Since starting our mill last July we have had no complaint of our flour from any market where sold. It gives universal satisfaction, and we have it scattered on the trade from Chicago to Galveston, Texas. Our yields are all that are attainable. We have tested it on both Spring and Winter wheats with satisfactory results on both varieties. Since the mill was turned over to us we have not changed a spout or a foot of cloth, nor have we found it required to make any changes. We have run as long as six days and nights without shutting steam off the engine, not having a "choke" or a belt to come off. The mill is entirely satisfactory to us, and for a fine job of workmanship, milling skill and perfection of system, we doubt if it is surpassed in the United States to-day. It is certainly a grand monument to the ability and skill of Col. C. A. Winn, your Milling Engineer and Designer. You may point to this mill with pride and say to competitors, "You may try to equal, but you will never beat it." Wishing you the success that honorable dealing deserves, I am,

Yours, etc.,

R. H. FAUCETT, Prest.

500 BARREL MILL IN ILLINOIS.

MESSRS. NORDYKE & MARMON CO., INDIANAPOLIS, IND.

Gents:—We started up our mill in June last year, and it gives us pleasure to say that your Roller Mills are doing splendid work and give us no trouble. Your milling program required no changes, and concerning yields, we get all the flour from the offals, and we sell our best grades in the principal markets of the United States at the highest prices offered for any flour. All the machinery made by you is first-class, and we would not know where to purchase as good.

Yours respectfully,

DAVID SUPPGER & CO.

125 BARREL MILL IN INDIANA.

NORDYKE & MARMON CO., INDIANAPOLIS, IND.

Gentlemen:—The 125 barrel All Roller Mill you built us has been running all summer, and does its work perfectly. Before contracting with you for this machinery we visited many Roller Mills throughout the West and Northwest, built by the different leading Mill-furnishers, and from all we could see, those built by you seemed to be giving the best satisfaction, and this is why we bought our machinery of you. Our mill comes fully up to your guarantees, and the capacity runs over your guarantee. The bran and offal is practically free from flour, and our patent and bakers' flour compares favorably with any we have seen elsewhere. I don't think anyone can beat us. Your Roller Machines are the best we have seen; they run cool, and the interior does not sweat, and cause doughing of the flour. Judging from our success, we would recommend other millers to place their orders with you.

Yours truly,

J. T. FORD.

Letters on file in our office from a large number of small Roller Millers giving as favorable reports as above. A portion will be published as occasion demands.

SPECIAL MILLING DEPARTMENT!

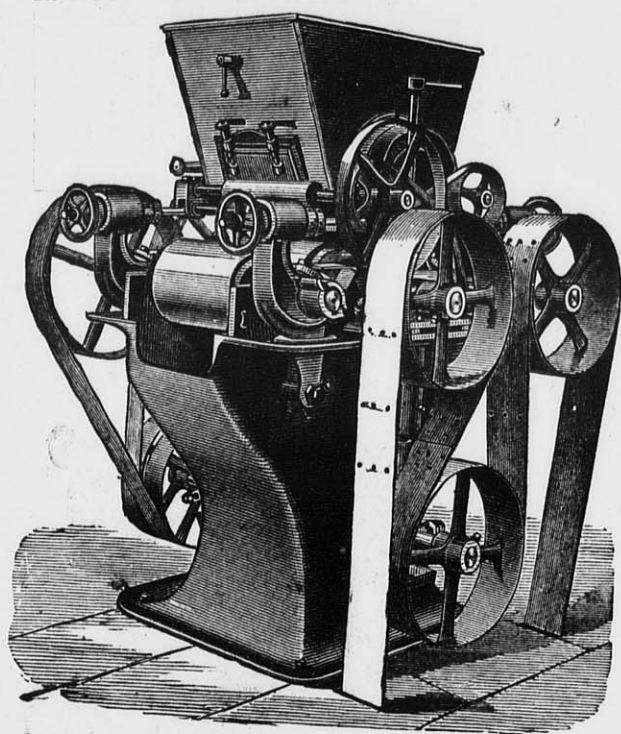
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We can send competent men to consult with any millers who contemplate an improvement, and whom they can depend upon as being RELIABLE AND THOROUGHLY COMPETENT to advise them as to the number and kind of machines required, best method of placing them and the change required, if any, in the bolting and purifying system. WE DO NOT URGE A GENERAL CLEANING OUT OF ALL OLD MACHINERY unless we clearly see such would be the ONLY COURSE TO PURSUE to make a SATISFACTORY AND RELIABLE MILL. In nearly all instances we can use all the Old Machinery, leaving it in its original position, or with as slight a change as possible. We aim to make the Improvement so that it will be a Profitable one to the Miller, and at the least expense possible.

Our System is THOROUGH and RELIABLE, and our Roller Machine Perfected by Long Experience, and the Miller takes no chances in using them, as HE DOES with the New Fangled Notions of Drive and Adjustment on many other machines now TRYING TO FOLLOW OUR IMPROVEMENTS and still avoid our Patents, in BOTH of which THEY FAIL. We were the first to advocate the Entire Belt Drive, and were opposed by every other maker, who claimed it was not positive, etc., etc., and now that our Belt Drive is an ACKNOWLEDGED SUCCESS, and will SUPERCEDE EVERY OTHER STYLE, these advocates of Gear Drive have suddenly learned that Belts are the Thing. The same may be said of our Spreading Device, Feed Gates, and Adjustable Swing Boxes. Other Makers are now copying these. ALL these Features, including BELT DRIVE with ADJUSTABLE COUNTERSHAFT and TIGHTENER, the SPREADING DEVICE, FEED GATES, Adjustable Swing Boxes and Leveling Devices, Self-Oiling Boxes, etc., are secured to us by several Strong Patents, and we CAUTION MILLERS in regard to these Infringements of Our Patents and Rights, for we shall look to THEM for Redress. The matter is in the hands of our Attorneys, who will soon take VIGOROUS ACTION against the Makers and USERS OF MACHINES infringing Our Patents.

Several machines are already on the market which Broadly Infringe, and we are informed that other makers are now changing their Old Style Machines, and adopting in a large measure Our Improvements. BEWARE OF THEM.

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Southern Exposition at Louisville, Ky., 1883.

The Board of Directors has confirmed the following report of the Jurors on Awards for the Southern Exposition of 1883, and decreed an award therewith as follows:

REPORT ON AWARDS.

PRODUCT—Roller Mills (Gilbert & Livingston). EXHIBITOR—STOUT, MILLS and TEMPLE, Dayton, Ohio.

AWARD—A Medal for the **BEST ROLLER MILLS.**

The Award as made above is in the hands of the engraver, and will be delivered soon as completed.

Louisville, Nov. 26, 1883.

J. M. WRIGHT,

General Manager.

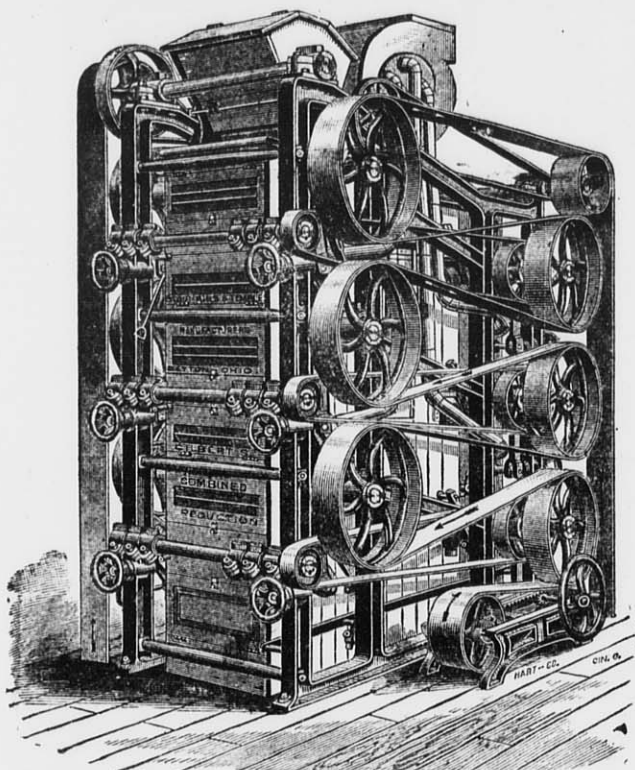
The above is an exact copy of notification of Award sent us. Cuts of Roller Mills referred to.



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It is used in a Gradual Reduction Mill to make the breaks, and to do the scalping between same, and aspirates the stock after EACH separation. The products from the Mill are Bran for the Duster, and Middlings for the Purifier.

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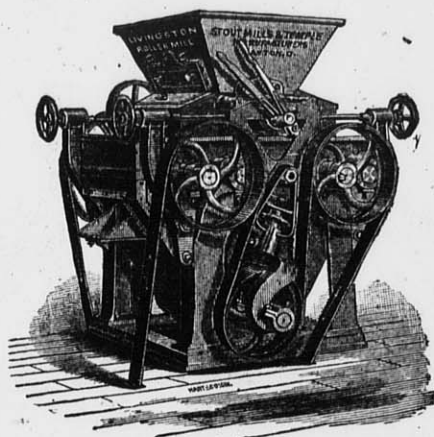
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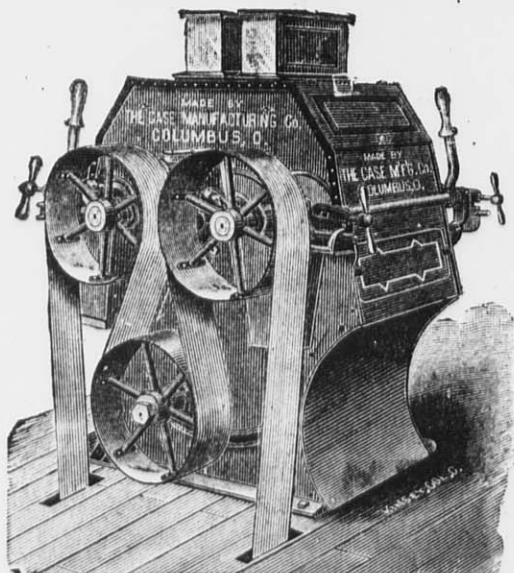
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